LONG TERM CARE IN A NEWFOUNDLAND REGION

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by

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Abstract

The St. John's region in Newfoundland, Canada had a population of 8435 ≥ 75 years in 1996, with 996 nursing home (NH) beds and 550 supervised care (SC) beds. However, only 116 SC beds were available at this time in the city of St. John's, where the majority of this at risk population lived. A single entry system to these institutions was implemented in 1995. To determine the need for long term care (LTC) two incident cohorts requesting placement were studied in 1995/96 (n=467) and in 1999/00 (n=464). Degree of disability was determined using the Residents Utilization Groups-III Classification (RUGs) and the Alberta Resource Classification System (ARCS). Time to placement and survival were measured. Factors predicting placement into LTC and mortality were determined. To determine the impact of the single entry system, clients of six NHs were assessed in 1997 (n=1044) and in 2003 (n= 963).

The number requiring placement increased from 392 to 431 from 1995/96 to 1999/00, an increase of 10% over four years. The population increase in those ≥ 75 years during this time was 8%. Comparing the two time periods, demographic characteristics were similar in the two incident cohorts. The proportion with no indicators for NH was the same (36%), and the proportion sent to SC was 25 and 28% in 1995/96 and 1999/00, respectively. There was no difference in RUGs classification between the two incident cohorts and the proportion classified as high level of care i.e., 6/7 on ARCS remained the same (22 vs. 23%). NH clients in 2003 differed from those in 1997; in 2003 the mean length of stay was shorter (3.7 vs. 4.5 years); the proportion with no indicators for NH care was smaller (10 vs. 19%); the proportion requiring special care/clinically complex

was higher (45 vs. 30%); and the proportion with a low level ARCS i.e., 1/2 was smaller (16 vs. 25%). This suggests that clients admitted to NH care following the start of a single entry system were more appropriately placed than before. Time to placement was unchanged for SC and NH care comparing both time periods. Time to placement in SC was much faster than in NHs. Independent factors which influenced time to placement included residence, RUGs, panel recommendation, sex, and age. Time from panel assessment to death for those recommended for SC was unchanged in both incident cohorts (3.09 vs. 3.02 years), as was those recommended for NH (2.35 vs. 2.23 years). Independent factors that influenced mortality included RUGs, sex and age. Using optimal methods of placement in 1995/96, as defined by a decision tree, the need for NHs decreased (75 to 37%); for SC increased (25 to 37%); and SC for cognitive impairment (CI) was 26%. In 1999/00, the need for NHs decreased (72 to 44%); for SC increased (28 to 36%); and SC for CI was 20%. Using optimal methods of placement, a deficit of 253 SC beds in the city and an excess of 235 outside the city would occur by 2014. An excess of 692 NH beds in the city and a deficit of 164 outside the city will exist. A total of 251 SC beds for the CI are crucial.

It was concluded that the St. John's region had an excess of NH beds and a geographic imbalance of SC beds leading to over-utilization of NH beds. The single entry system succeeded in improving the appropriateness of utilization of NH beds. Nonetheless, SC facilities for the elderly with modest disability and for those with CI are necessary, as is a reduction in NH beds.

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List of Abbreviations

ADL = Activity of Daily Living

ARCS = Alberta Resource Classification Score

B = regression coefficient

CCC = Complex Continuing Care

CDS = Chronic Disease Score

CI = Cognitive Impairment

CIWD = Cognitive Impairment without Dementia

DAD = Discharge Abstract Database

GDP = Gross Domestic Product

LTC = Long Term Care

M = Mean

Mdn = Median

MDS = Minimum Data Set

NH =Nursing Home

NLCCA = Newfoundland and Labrador Continuing Care Assessment

PCH = Personal Care Home

PRC = Patient Research Center

PSW = Personal Support Worker

RAI = Resident Assessment Instrument

RAP = Resident Assessment Protocols

RCFS = Resident Care Feasibility Survey

RUGs = Resource Utilization Groups-Version III

SE = standard error

SC = Supervised Care

SCU = Special Care Units

95% CI = 95% Confidence Interval

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Chapter 1

Introduction

This chapter is divided into three main sections. The first section will provide an overview of four topics related to this project. These include population aging, long term care (LTC), cognitive impairment (CI), and the LTC system in the St. John's Community Health Region. The second section will provide a statement of the study problem. The third section will outline the purpose of the study including the study objectives and specific research questions. The rationale of the study will also be given.

1.1 Overview

1.1.1 Population Aging.

In Canada and most of the developed world, population aging has occurred and will continue to increase (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006; Statistics Canada, Government of Canada, 2009; Lakdawalla, Goldman, Bhattacharya, Hurd, Joyce, & Panis, 2003). This has resulted in economic, political and social challenges (Tousignant, Herbert, Dubuc, Simoneau, & Dieleman, 2003). The age structure of a population is a result of three population processes: fertility, mortality and migration that produce both immediate and long-term effects on size and age composition (Grigsby, 1991). The main factors explaining the aging process of the Canadian population are fertility rates that are persistently below the generation replacement level and an increasing life expectancy (Statistics Canada, Government of Canada, 2009). Beginning in the 1970's, the needs of the elderly increased as a result of an increased proportion of elderly people but also because of changes in family structure. These

changes included more women in paid employment such that fewer women were available to care for their aging parents. In addition, more children were separated from the family home through education and employment opportunities abroad (Crichton, 1997). The baby boomers moved away from home and contributed towards greater community-based and institutional development (Cai, Salmon, & Redgers, 2009).

As of July 1, 2009, 13.9% of Canada's aging population was composed of persons 65 years and older. As the baby boomers enter this age over the coming years, it is estimated that by the end of the 2030s, they could account for almost 25% of the total population. As of July 1, 2009, 3.8% of the population included people 80 years and older. In addition, it was estimated that there were 6000 people aged 100 and older and this figure could reach an outstanding 15,000 by the 2030s (Statistics Canada, Government of Canada, 2009).

Similar trends have been happening in other nations. Other countries including France, Germany and United Kingdom had an even higher proportion of seniors 65 years and older at 16.6%, 20.2% and 16.0%, respectively. The United States had a slightly lower proportion of seniors with 12.8% (Statistics Canada, Government of Canada, 2009).

As people age, they may develop multiple chronic conditions that increase their chances of becoming dependent (Cai, Salmon, & Redgers, 2009). Aging of the population has lead to a growing demand for health, medical and LTC services (Sarma & Simpson, 2007). A large number of people will spend their remaining years depending on

others and a significant proportion of these people will spend a large amount of this time institutionalized in LTC.

1.1.2 Long Term Care.

LTC in Canada was an afterthought to the main social policy developments of income support and health insurance programs. In the early 1970s, the number of people vulnerable and in need could not be ignored. At this time, LTC dominated public policy (Crichton, 1997). LTC refers to institutional or community based care intended for people who have some degree of disability. LTC services include institutional care, community based services, and home based services. Community and home-based care are designed to sustain individuals in their homes safely and adequately. Individuals in institutional care need higher levels of personal care requiring some level of supervision or assistance with activities of daily living, 24 hour nursing care or supervision, and a secure environment (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006). The institutional care facilities include nursing homes (NHs) and supervised care (SC) facilities, which vary in the services they offer.

Canada has relied significantly on NH care. A study conducted in Manitoba reported that in their province, 24% of individuals 85 years and older lived in LTC facilities and that in the United States, 1.6 million individuals lived in LTC institutions (Menec, Blandford, & Veselyuk, 2009). Another article stated that 32% and 14% of adults older than 85 years of age were residing in NHs in Canada and the United States, respectively (Jaffe, 2009). These numbers indicate the great dependence individuals have on LTC as they age. A large proportion of individuals in Canada and the United States

spend their final days in LTC institutions (Jaffe, 2009; Menec, Blandford, & Veselyuk, 2009; Motiwala, Croxford, Guerriere, & Coyte, 2006).

NH care has been reported to be the largest component of LTC expenditures for the elderly population. In the United States, institutions such as NHs consumed 75-85% of the public LTC dollars (Borrayo, Salmon, Polivka, & Dunlop, 2002) and NHs have accounted for nearly half of the Medicare LTC spending (Cai, Salmon, & Redgers, 2009). Publically funded LTC consumes, on average, about 1% of Gross Domestic Product (GDP) in Organization for Economic Co-operation and Development countries (Martikainen, et al., 2009). The estimated total spending on the LTC sector in Canada has accounted for approximately 1.25% of the GDP (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006).

A major challenge facing LTC is the continued escalation of costs in the provision of this care, coinciding with decreased availability of resources from the federal government as it attempts to control the financial deficit (Crichton, 1997; Desrosiers, 2004). As a result, almost all provinces are examining future models of health care delivery.

Studies have reported inappropriateness of placement of LTC residents (Fisher, et al., 2003; Hughes, McDonald, Barrett, & Parfrey, 2008; McCann, O'Reilly, & Cardwell, 2009; Reddy, 2002). Many NH residents do not warrant care in these settings, and a lower level of care would be more appropriate. Also, increased resources could be directed to community based LTC rather than a higher level of institutional care (Worrall

& Knight, 2003). Unnecessary institutionalization adds to the significant financial burden a growing population will have on public health care.

There have also been concerns that residents in LTC receive inadequate care (Gnaedinger, 2003; Grant & Potthoff, 1997; Schindel-Martin, Morden, Cetinski, Lasky, McDowell, & Roberts, 2003; Young, Binns, & Greenwood, 2001). Desrosiers (2004) stated that respect for human dignity is not negotiable and that Canadian residential and LTC facilities have been accused of becoming only living environments instead of caring environments.

The inappropriate and inadequate provision of LTC has been increasingly recognized as a higher proportion of LTC residents have cognitive impairment. These clients have very unique needs and it has been suggested that these special needs are not being appropriately met in the LTC system.

1.1.3 The Cognitively Impaired.

Knowledge of the prevalence of CI, including dementia, is required to accurately assess the care needs of a population, given that the needs of this subgroup are different from other clients availing of LTC services (Feng, et al., 2009; Gnaedinger, 2003; Schindel-Martin, Morden, Cetinski, Lasky, McDowell, & Roberts, 2003; Young, Binns, & Greenwood, 2001). Dementia is one of the most burdensome health problems affecting seniors and is one of the most costly in its impact on health care services (Caron, Ducharme, & Griffith, 2006; Rockwood & Stadnyk, 1994) . In 1991, 252,600 Canadians aged 65 years and older, or 8% of seniors, met the criteria for dementia, equally divided between the community and LTC institutions (McDowell, Hill, & Lindsay, 2001). Clients

who were not classified as having dementia, but were classified as cognitively impaired, comprised a further 16.8% (McDowell, Hill, & Lindsay, 2001). In 2006, it was estimated that 420,600 Canadians over 65 years had Alzheimer's disease and related dementias. Also, due to population aging, this number was expected to reach 750,000 individuals by the year 2031 (Caron, Ducharme, & Griffith, 2006). The annual economic cost of dementia has been estimated at $3.9 billion dollars (Osbye & Crosse, 1994) and may be higher in more recent times.

This has a large impact on the LTC system when a substantial proportion of the population in LTC is composed of these clients and when the population is continuing to age. The recognition that a portion of clients in the LTC system are cognitively impaired has occurred in the St. John's Community Health Region in Newfoundland, and this is one of the problems contributing to the inappropriate provision of LTC in this region.

1.1.4 Long Term Care in St. John's Community Health Region.

In the St. John's Community Health Region, LTC options are divided into NH care, personal care homes (PCHs), and home care. NH care is ideally for individuals with complex medically problems who require a high level of care. PCHs are supportive housing environments that vary greatly in the kind of services they provide. They do not provide substantial medical care, and primarily provide room, meals and personal assistance. They are geared towards clients with lower levels of disability since professional nursing staff is not employed in these facilities. They aim to provide a home-like environment. Home care is provided by formal (paid) or informal (unpaid) caregivers, and is supplemented by community services. This type of care is aimed at

providing assistance to individuals who need extra support, while still living independently within their home.

In 1995, the Department of Health and Community Services implemented the single entry system in the St. John's Community Health Region, one of six health regions in the province of Newfoundland and Labrador. This region extended from Seal Cove, Conception Bay South to St. Shott's in the Southern Shore. A map highlighting the Community Health regions, including the St. John's region is presented in Appendix I. In 2004, it included a total population of 184,878, of which 9,818 were 75 years and older (Government of Newfoundland and Labrador, 2004). This region comprised an urban population of 110,927 in St. John's and Mount Pearl and a rural population of 73,951.

One intent of the single entry system was a more appropriate use of NH care. Previous to the single entry system, clients applied to any or all facilities they wished and it was up to the facility to admit that client or not. Entry to NH and SC was negotiated separately with each institution, leading to concern about utilization of NH beds for clients with low levels of disability.

When a client applies for LTC, a multi-disciplinary Community Health panel reviews the application and decides which level of care the client will be placed. At this point, community services are not considered. In this regard, a *true* single entry does not exist. There is a lack of integrated assessment for community support options. Instead, institutional LTC is the only option. Applicants apply separately for either home supports or institutional placement into LTC, and this implies the lack of an efficient, fully integrated assessment of need. The panel identifies the functional disabilities, levels of

care, financial situation, and client preference prior to making a placement decision. No applicant is denied placement altogether. However, waiting lists for NH beds are long and clients awaiting placement to NH often occupy acute care hospital beds. Demands for more NH beds persist despite the fact that empty PCH beds are available.

The LTC system in this province has been studied by the Patient Research Center (PRC) over the last number of years (Hughes, McDonald, Barrett, & Parfrey, 2008; McDonald & Parfrey, 2004; O'Reilly, Parfrey, Barrett, & McDonald, 1998; Reddy, 2002; Stuckless, 2000) and many of the findings have been the foundation on which this thesis was based. To summarize, it has been found that clients were recommended for and placed in higher levels of care than necessary. In addition, the waitlist for NH care was long while placement into SC was more efficient (O'Reilly, Parfrey, Barrett, & McDonald, 1998). Other studies also found that those individuals already residing in NHs required a lower level of care than they were receiving and that a proportion of these clients had CI as the primary reason for placement in a NH bed (McDonald & Parfrey, 2004). The Western and Labrador regions were compared to the St. John's Region and similar concerns were found. It was suggested that alternate facilities for clients with CI may reduce inappropriate placement into NH beds (Stuckless, 2000). In addition, another study stressed the dependence on expensive NH's and concluded that alternative less expensive sites of placement would be more appropriate (Reddy, 2002). More recently, the Clinical Epidemiology group in the PRC have published a study comparing the type and annual rate of clients seeking placement to LTC in five provincial health regions (Hughes, McDonald, Barrett, & Parfrey, 2008).

1.1.5 Summary.

LTC in Canada has been influenced by the reality of population aging, since a higher demand for institutional placement into LTC facilities has resulted. The inability of government to provide efficient, high quality care in this regard has resulted in a crisis for seniors and their families (Desrosiers, 2004). Stagnation in the availability of resources for LTC is a reality similar to that seen elsewhere (Borrayo et al, 2002) as the need for LTC has resulted in strain on public budgets (Meijer, Koopmanschap, Koolman, & Doorslaer, 2009). In addition to not being able to provide efficient high quality care, the appropriateness of the provision of that care has been challenged. Clients have been placed into higher levels of care than required, and it has increasingly been recognized that unique needs exist among a substantial proportion of these clients, specifically those with CI. As a result of these concerns, assessment and restructuring of the LTC system is necessary.

1.2 Statement of Problem

Delivery of LTC services in the St. John's region has been a challenge and this challenge will continue to worsen as the demands for LTC placement rise. The problems of LTC delivery have included the increased financial burden on our system and evidence suggesting inappropriate placement of clients into a level of care they do not require or are not suited to. Another problem has been inefficiency of the system to place clients in a facility quickly, thus increasing waitlists and the burden on families and hospitals. Clients often occupy acute care beds while waiting for LTC and the waitlist for NH beds has been long despite available PCH beds. The provision of LTC has been inefficient and

inappropriate and consequently the LTC sector needs to be restructured to deal with these problems, particularly in the face of an aging population and increase demand for this health care service.

1.3 Purpose of Study

This study was supported through the St. John's Nursing Home Board/Provincial Department of Health and Community Services. It was conducted on behalf of the government to assess the LTC system in St. John's by determining the appropriateness and efficiency of the LTC system and to predict the future demand for LTC beds. This information was part of an ongoing initiative to help guide policy makers and to plan for the future demands for LTC; to help utilize scarce resources as efficiently as possible; and to help in providing information about appropriate alternatives to expensive nursing home beds and alternatives to institutionalized LTC facilities for clients who are not optimally suited for this care. Recommendations have been submitted to government. The proportion of seniors ≥75 years had increased and was forecasted to increase by 38%, from the year 2000 to 2018. In light of this growing need, an evaluation of the LTC system was critical.

1.3.1 Study Objectives.

The study was conducted with three broad objectives. One objective was to assess the appropriateness of decision making and efficiency of the single entry system in the St. John's Region in two incident cohorts at the beginning of 1995/96 and 1999/00, four years after its initiation.

The second objective of this study was to assess the appropriateness of utilization of NH beds in two prevalence cohorts in 1997 and 2003. These populations were compared to assess the effect of the implementation of the single entry system that occurred in 1995.

The third objective at the time of this study was to determine the need for future LTC in the region in 2004 and 2014. A comparison of the characteristics and natural history of the two incident cohorts evaluated a number of assumptions used to make these predictions.

1.3.2 Research Questions.

To achieve the above research objectives, the following specific research questions were asked:

1) Is the annual incidence rate of clients for LTC staying the same?
2) Has the single entry system increased the appropriateness of placement?
3) Is the degree of disability of clients for LTC changing?
4) Is prognosis of clients in LTC remaining constant?
5) What are the risk factors for death in LTC clients?
6) Is bed utilization inappropriate?
7) Are housing alternatives for the cognitively impaired more appropriate than NH beds?
8) Will there be a long term care bed crisis in the future?

1.3.3 Rationale of Study.

As a result of the aging population, the demand for LTC has increased. This means the demand for additional resources to support this population has also increased. It was crucial to evaluate this LTC system for a number of reasons. There was an ongoing need for government to know the extent of the increased demand for LTC so they could make informed financial and planning decisions. Clients who request LTC should have adequate access to this service in terms of efficiency in placement and geographic options. Furthermore, clients should be placed into the appropriate level of care facility for their needs. Also, there is an ongoing need for government to know how and where the delivery of LTC resources is inefficient so they can manage scarce resources effectively. If these issues were not studied and recommendations were not made to government, the provision of LTC would continue its dependence on expensive and inappropriate nursing homes.

Chapter 2

Review of Literature

This chapter is divided into five main sections. The first section will provide a review of the Canadian LTC system, specifically financial considerations, the variation of LTC across the country, and the single entry system.

The second section will give an overview of LTC in specific Canadian provinces. In addition to a review of published literature, a review of relevant current government developments and issues will be described.

The third section will discuss LTC in the St. John's Region. A description of the levels of care used for assessment of individuals and how LTC beds are classified will be given. In addition, this section will give an overview of funding specific to this region in terms of how it relates to an applicant requesting placement. A review of the LTC studies conducted in the Patient Research Center in St. John's will also be presented.

The fourth section will describe the use of assessment tools, case-mix classification systems and two specific assessment tools: the Resource Utilization Groups-Version III (RUGs) and the Alberta Resource Classification Score (ARCS). Their role in assessing clients for LTC will be discussed.

The fifth section deals with CI. There was a vast amount of published literature on dementia and CI. This section will review relevant studies that address the cognitively impaired in relation to their needs for LTC and the implications of this special group to the provision of LTC.

2.1 The Canadian Long Term Care System

2.1.1 Financial Considerations.

Although there is a universal health care system in Canada, facility based LTC is not a publicly insured service under the Canada Health Act (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006). The Canada Health Act divides services into either insured or extended health care. Insured service covers hospital care and services provided by physicians. Extended health care services are considered those services provided by NHs or LTC, home care, adult residential care and ambulatory health care services (Jacobs, Mills, & Hollander, 1997). Funding for LTC comes from the federal government, providing block funding to provinces and territories for various sectors of health care, including LTC. Financial authority, regulations and policies are a provincial responsibility while the program development and delivery of LTC is the responsibility of the regional health authorities in most provinces. As such, the development of institutional facilities for the elderly and of community supports for those in need vary across the provinces and territories (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006). Some provinces may prefer to support the elderly in their homes while others give greater support to nursing homes (Carriere & Pelletier, 1995).

2.1.2 Provincial Variation in Long Term Care.

Despite concerns over increased spending in the LTC sector in Canada, policy around cost and quality of LTC has been nearly absent from the political agenda (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006). Debates in Canada about LTC have been largely unproductive. This can be blamed, at least partially, on the provincial

variation within the LTC system. The provincial diversity within the Canadian system has been acknowledged and described previously (Chan & Kenny, 2001). More recently, this diversity was studied and a pan-Canadian descriptive analysis of the LTC industry was conducted in an effort to initiate discussion about the significance and feasibility of a national LTC policy (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006). This study used longitudinal data collected by Statistics Canada through the Resident Care Facilities Survey (RCFS) from LTC facilities operating during 1996 to 2001. This study made observations about environmental and organizational characteristics, and aggregated data across five regions. These regions represented logical groupings that combined data across provinces having similar governance structures. In addition, dividing the country into five regions allowed the authors to overcome reporting constraints related to Statistics Canada data. The five regions included: 1) British Columbia; 2) Alberta; 3) the Prairies (Saskatchewan and Manitoba); 4) Ontario and 5) Atlantic (New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador).

This study made four key observations relating to regional similarities and differences. First, they observed differences in the distribution of LTC facilities by type of ownership across regions. These types of ownership included government owned, For-profit and Not-for Profit facilities. They argued that ownership influences the capacity to address the needs of clients, the facility mandate and operations of the facilities. The authors discussed that For-profit facilities may be less likely to reinvest revenues into service and instead keep profits in the hands of shareholders. Not-for Profit facilities may be more likely to reinvest funds to improve care provided to clients. On the other hand,

facilities making a profit may have more financial freedom to improve their facility. They concluded that this is an area worthy of study as the true understanding of the ownership of a facility and performance outcomes are unknown (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006).

The second observation was that government owned facilities were much larger than other facilities. The size of a facility reflects operational differences, for instance a larger facility may be better able to secure vital resources and respond to change. Work of policy analysts have suggested that small facilities may be discriminated against in terms of their ability to avail of resources and meet costly provincial standards. This is another area of potential study to explore how facility size impacts the standard of care given to clients (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006).

The third observation relates to differences in staffing intensity levels, particularly how these differ by ownership type. Total direct staffing levels were significantly higher in government owned and not-for-profit facilities compared to other ownership types. For-profit facilities had the lowest staff intensity levels. The staffing levels overall in this study were comparable to those provided elsewhere in Canada. The authors concluded that further research is needed to determine if policy makers should consider whether current staffing levels are adequate and acceptable (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006).

Finally, this study identified a difference in the types of care clients receive by region and ownership. Clients requiring more complex care resided predominantly in government owned facilities, where generally the highest total nursing levels and overall

staffing levels were seen. Lower levels of care were provided primarily in Not-for profit facilities where the highest unregulated staffing levels were seen. The authors questioned whether this was intentional and whether this segmentation impacted access to and quality of types of LTC needed by clients (Berta, Laporte, Zarnett, Valdmanis, & Anderson, 2006).

A criticism of this study was that details of each and every province could not be appreciated. In this instance, details of how Newfoundland compares to the rest of Canada (for the purpose of the present study) could not be directly obtained. However, the authors explained and accounted for the regional grouping of provinces.

This study was an important contribution to the LTC literature as it provided a more recent overview of aspects of the LTC sector in Canada. Previous key studies which described the LTC system in Canada and its financing have provided a great source of knowledge, and although some of the information within these studies are still valid, some of the information is outdated (Crichton, 1997; Hirdes, 2001). This study addressed and compared some aspects of LTC within Canadian provinces. It suggested multiple areas of potential research and that regional research was necessary to assess quality of LTC, access to LTC and costs of LTC. Although this study did not ask the same research questions as the current study, it highlighted the relevance of studies such as ours, as the objective was to assess LTC in the St. John's region.

2.1.3 Single Entry System.

A productive development in the Canadian LTC system was the implementation of a single-entry system in many provinces. Ideally, this system allows clients to access

both institutional and community services through one assessment process by an interdisciplinary team. A single entry system for accessing LTC provides a consistent screening program that ensures needs are matched with appropriate services. This minimizes the number of clients that may be provided unnecessary care and results in a more efficient system. Often, the single entry assessment enables the senior to receive community-based services, avoiding or delaying entry into a NH. It is *one stop shopping* for care services and therefore is more convenient for the client as they do not have to speak to multiple sources. It results in greater accessibility to the care system (Public Health Agency of Canada, 2009; Reamy, 1996).

Seven provinces in Canada have implemented the single entry system, or a version of this system, although not all of them are fully developed and comprehensive. These provinces include British Columbia, Alberta, Saskatchewan, Manitoba, New Brunswick, Prince Edward Island and Newfoundland. Others have partial single entry systems including Ontario or parallel systems for facility care and home care including Quebec, Nova Scotia and Yukon. Quebec is moving towards a single entry system through its community health centers and the Northwest Territories is currently developing a single entry system. Almost all jurisdictions have a standard assessment tool for residential care (Public Health Agency of Canada, 2009).

2.2 Long Term Care in Canadian Provinces

2.2.1 Nova Scotia.

In Nova Scotia, nursing homes are called homes for the aged. These provide 24 hour nursing care or supervision to those who are unable to stay independently in their

homes. Other LTC options include retirement homes, government subsidized home care, private home care and adult day care.

On May 10th, 2006, the Nova Scotia government announced their Continuing Care Strategy, a 10 year strategy to expand LTC services. The government committed a total of 476 million dollars for 2006/2007, an increase of 51 million over the previous year (Government of Nova Scotia, 2006). This plan focused on in-home/community services which aimed at expanding home care, respite, and palliative care. In addition, the plan included 1320 new LTC beds within the province over the following 10 years (Nova Scotia Health, 2006). As of August, 2009, 143 new LTC beds were provided including NH beds, residental care beds and interim beds. By 2011, another 942 LTC beds will be completed (Government of Nova Scotia, Department of Health, 2009). The government formulated *An Approach*, a strategy that used evidence and consultations to understand pressure in the province and needs for contining care beds (Government of Nova Scotia, Department of Health, 2009).

2.2.2 British Columbia.

Hollander and Pallan (1995) described the first comprehensive and integrated service delivery system that was developed by the Ministry of Health and Ministry Responsible for Seniors in British Columbia. The Continuing Care System included a single entry to LTC and contained all major components of LTC and home care services. International observers considered it to be an integrated, efficient and effective system (Hollander & Pallan, 1995).

Over time, controversy developed in British Columbia regarding the reversal of promises made by the government, reversing a promise to build 5000 LTC beds by 2006. On April 23rd, 2002, the BC government pledged to build 1,500 new LTC beds and 3,500 assisted living units. Following this, the promise dissolved and it was announced that no new LTC beds would be built. Instead over three years, 3,111 long term care beds would be cut and 3,799 assisted living units would be provided. As a result, clients were no longer placed on a waitlist. Seniors no longer had a choice of facility but instead were placed in the next available bed, often far from their home community. Unless clients were classified as having complex needs, access was restricted to assisted living or community care. Home support services also continued to decline (British Columbia Health Coalition, 2003; Cohen, 2003). British Columbia's situation was in sharp contrast to the rest of Canada at the time, where no other jurisdiction had demanded such large bed closures. In fact, it was noted that some provinces were increasing the number of beds available, such as Manitoba and Ontario. As of September 17th, 2003, 2774 LTC beds (89% of their target) were reduced or were in the process of being reduced (British Columbia Health Coalition, 2003).

More recently, the government of British Columbia reported they have modernized and improved care options for seniors. They have built 13,000 new or replacement beds and units for residential care, assisted living and supportive housing. This was a net bed increase of 6000 units since 2001, meeting their goal of a net increase in 5000 beds by the end of 2008. Spending on home care and home support has increased 69% since 2001 and the number of clients receiving this care has increased by 14%. 71%

of these recipients pay nothing for this service. In addition, the number of subsidized hospice beds has quadrupled since 2001 from 57 to 279. The wait times for residential care have been reduced from up to one year to less than 90 days (British Columbia Ministry of Health Services, 2009).

2.2.3 Alberta.

Alberta LTC services are provided in three streams described as home living, supportive living and facility living. Each stream can provide clients with a broad range of health and personal care, accommodation and hospitality services. (Alberta Health and Wellness, 2008). Albertans have made it clear that they would prefer to receive health care and services in their own homes or community based settings to preserve their independence and dignity. Alberta's Continuing Care strategy was intended to provide new ways of delivering services, offering more choice to Albertans, and focusing on expanding these home and community services (Alberta Health and Wellness, 2008).

In 2008, 14,500 seniors and persons with disabilities lived in LTC facilities at any given time. Many more resided in the acute care sector waiting for LTC beds. It was felt that other options were necessary, as the demand for LTC would only increase as the population aged (Alberta Health and Wellness, 2008).

The Continuing Care strategy was composed of six broad strategies, each with several initiatives. One strategy was to increase community supports by increasing home care funding. The goal was a 25% increase in daily home care hours by 2012. Another initiative was to increase emergency department support whereby a support team assesses an individual and provides short term interventions for their care and plans for possible

LTC if required. This would reduce unnecessary stays in acute care hospital beds. The goal was to have six teams in place by 2012 (Alberta Health and Wellness, 2008).

Another strategy was to increase infrastructure. The goal was to provide 1225 affordable supportive living spaces and to refurbish or replace half of all LTC beds. Other strategies included changing the way long-term accommodations are paid for; options to fund individuals based on needs and/or funding providers; and providing equitable drug coverage for people, wherever they live (Alberta Health and Wellness, 2008).

2.2.4 Ontario.

There are two main types of care provided in Ontario. These include home and community care as well as residential care. Home and community care help individuals manage their care while at home and are divided into four main categories. These include visiting professional services, personal care, homemaking, and community support services. The second type of care is residential care. These options allow people to move to a place that provides the level of support they need. Three main types of residential care include supportive housing, retirement homes, and LTC homes, also called nursing homes. In this province, there are two different options for use of stay in a nursing home, defined by length of stay. Long stay refers to care for an indefinite period of time. Short stay refers to a temporary stay, up to 90 days a year. This can provide a respite service where a caregiver is provided a break from their caregiver duties, or a supportive service where an individual can gain strength and confidence following a stay in a hospital. (Ontario Ministry of Health and Long Term Care, 2009).

A provincial *aging at home strategy* was announced on August 28, 2007. This

included a marked expansion of community living options for seniors. In addition, it included a wider range of community support services and home care options to help individuals remain independent by staying in their home longer. This included a commitment of more than $700 million in funding over three years. Ontario's 14 local health integration networks would lead the initiative in an effort to direct services to the needs of the local population (Ontario Ministry of Health and Long Term Care, 2007).

2.2.5 Manitoba.

Manitoba has been a leader in LTC delivery. It was the first province to implement the single entry system in 1974, which resulted in a significant reduction in NH bed use (Shapiro, 1993). Berdes (1996) described this province as the most advanced toward comprehensive and coordinated LTC. However, a more recent report suggested there were a number of critical areas where LTC in Manitoba was lacking despite having the highest rate of LTC beds per 1000 population over 75 in Canada (Manitoba Nurses Union, 2006). This report is an accumulation of expert observation, and analysis of Manitoba's nurses, as well as the work of other studies on LTC in recent years. Viewpoint Research conducted a survey in 2000 and 2006 of 500 LTC Manitoba nurses and this report incorporated the findings of these surveys. This report examined a number of issues such as patient acuity, facility standards, resident health and staffing, to name a few (Manitoba Nurses Union, 2006).

This study found that an increase in resident acuity has occurred in PCHs, a facility that traditionally provides supportive care for elderly who want to live independently. They stated this is likely a result of population aging and a shift to moving

patients from acute care. The problem is that facilities are staffed based on level of care required 30 years ago. Levels of care and staffing models have not been updated since 1973. As a result, workload and staffing reports indicated that high patient acuity has been a consistent factor in documented workload issues (Manitoba Nurses Union, 2006).

Another finding of this study was that with increased pressure to decrease costs, the substitution of for-profit residential care for non-profit and government care has occurred. However, for a given expenditure of public resources, the for-profit facilities provide less care and have fewer standards than facilities operated as non-profit (Manitoba Nurses Union, 2006). This contrasted with the conclusions of Berta, Laporte, Zarnett, Valdmanis, & Anderson (2006) who claimed that although there is some evidence for this, the true relationship between ownership type and care is not well researched.

In this study, there was a significant number of LTC residents who were cognitively impaired. These residents have different needs, require different interventions, and require more time. As a result, the nurses concluded that separate units or environments for the cognitively impaired are needed, and that these clients are impacting negatively on the well being of other residents (Manitoba Nurses Union, 2006).

In January 2006, Manitoba's Aging in Place Strategy was announced (Government of Manitoba, 2009). The province implemented a plan to develop new personal care spaces, new supportive housing facilities and to expand community based resources. Another exciting initiative which supports Manitoba's Aging in Place Strategy

was a partnering of the province with eight Manitoba First Nations to develop Winnipeg's first personal-care home for Aboriginal elders. This new 80 bed facility will be welcoming, culturally relevant and meet an identified need for elder care in the First Nation and Aboriginal community (Government of Manitoba, 2009). The goal was to make Manitoba the most age-friendly province in Canada (Government of Manitoba, 2009).

2.2.6 Saskatchewan.

Residential LTC is divided into special care homes and personal care homes, which offer higher and lower level care, respectively. Nursing homes are referred to as special care homes in this province. The government of Saskatchewan announced that as part of the Ready for Growth initiative, $152.8 million would be invested to build 13 new long-term care facilities throughout the province. This would replace 13 currently outdated facilities, ensuring the safety and comfort of residents and health care providers. More than 540 residents receiving LTC in a facility would benefit from this initiative and they would be spread throughout several communities (Government of Saskatchewan, 2009).

As a step in the development of a Seniors Care Strategy, Regina MLA Laura Ross led a consultation process in September and October 2009 to explore gaps in home care, community care and LTC services. The initiative helped to identify the feasibility and opportunities for expanding home care supports, improving the accessibility of personal care homes, and preventing falls within LTC (Government of Saskatchewan, 2010).

There are concerns about the LTC system in Saskatchewan (Canadian Union of Public Employees, 2009). A two-tiered system in this province may result in an increase in for-profit facilities and it has been shown that these facilities offer less staffing and provide poorer quality care than not-for profit facilities. In addition, this underfunding and privatization has created unequal access to LTC (Canadian Union of Public Employees, 2009).

2.2.7 New Brunswick.

New Brunswick offers a number of home care and residential care services to the people of this province. In 2008, the New Brunswick government released a strategy called *Be Independent. Longer.* It was a commitment to help seniors remain healthy and to stay in the community longer. Recently, the government released a document reporting the progress with this initiative (Government of New Brunswick, 2009).

This detailed document states that in April 2009, the Senior and Healthy Aging Secretariat, in partnership with the Public Health Agency of Canada, held a forum on healthy aging. This helped promote the importance of healthier and safer places for seniors to live. A 2.2 million dollar investment was committed for home support services in 2009/2010, which over 4500 residents of New Brunswick used regularly. A few of these services included assistance with personal activities and housekeeping. Since 2006, there has been a 12.5% increase in the rate of pay to home support agencies in an effort to increase retention of employees. There was also an increase in the maximum number of care hours per month to 336 (Government of New Brunswick, 2009).

Specialized housing funding has increased by $25 million since 2006. These are

privately owned and operated, and individuals can apply to the government for subsidies. These are suitable for individuals who require a low level of care. Since 2007, 90 new enhanced special-care home beds have been approved. Notably, 64 existing special-care home beds had been converted to admit clients with Alzheimer's and dementia, known as Level 3B residents. The enhanced special care home beds helped reduce waiting lists in NHs. Level 3B clients do not require full-time nursing care but they require special supervision due to their physical frailty or cognitive needs. It was expected that, as demand increases, more of these enhanced beds will become available as part of newly constructed facilities (Government of New Brunswick, 2009).

Policies have been put in place to ensure that eligible seniors are able to obtain NH services in the official language of their choice. Since 2006, investments have been made to build new NH beds and renovate old NH beds. When complete, investments in NHs will have totaled $167 million since 2007 (Government of New Brunswick, 2009).

2.2.8 Newfoundland and Labrador.

The government invested a record $2.6 billion in Budget 2009 for health and community services in Newfoundland and Labrador. This included $35 million to improve LTC services. Some of these allocations included $500,000 for site selection for a new LTC home in Carbonear; $19.2 million to complete construction of a 236-bed LTC home in Corner Brook; $9.3 million to complete construction of a 50-bed LTC in Happy Valley-Goose Bay; $5 million to start the redevelopment at the LTC home in Lewisporte; and $3 million to continue planning for two LTC homes to replace the Hoyles-Escasoni Complex in St. John's (Government of Newfoundland and Labrador, 2009).

In addition, part of the budget included an investment of $8 million to address growth in the home support program over 2009/2010. A $1.71 per hour increase to the home support hourly subsidy rate by January 1, 2010 was budgeted and $1.5 million invested to increase the PCH subsidy amount (Government of Newfoundland and Labrador, 2009).

2.2.9 Summary.

There were few published articles in the literature that studied specific and current LTC issues within a province or region. However, there was a large amount of information that governments provide for Canadian and provincial citizens to keep updated on LTC developments in their respective area. The review conducted in this thesis included a review of relevant recent developments in LTC in Canadian provinces and was by no intention a complete review on all aspects of LTC in every province.

It is clear that Canadian provinces have been aware of population aging and the significant impact this will have on governments and the elderly as the demand for LTC increases. The majority of provinces have recently implemented new strategies and initiatives that outline a plan to deal with this problem and many of these strategies were presented in lengthy comprehensive reports. Most initiatives covered all levels of LTC, including services provided in the community and those that are provided within a LTC residential facility. However, the majority of provinces have placed significant emphasis on home and community care (vs. institutional care) to help seniors maintain their independence.

Manitoba and New Brunswick identified the cognitively impaired as a special group requiring special needs in LTC. Their strategies and initiatives reflected this recognition.

Some provinces recognized that seniors with lower care needs do not need higher levels of care provided in a NH. They planned to provide these clients with more appropriate LTC, freeing up NH beds for individuals that require 24 hour care.

There was discussion surrounding the comparison of profit, not-for-profit and government facilities, as it relates to the quantity and quality of care residents receive. This is an interesting debate, and again, illustrates the variation of LTC both across the country but also within each province.

2.3 Long Term Care in the St John's Region

LTC beds in the St. John's region are assigned a level of care from one to four, referring to the lowest level of care and highest level of care, respectively. The levels of care eligibility criteria are defined by the Provincial Department of Health and Community Services and are presented in Appendix II. The criteria are divided into three categories including personal functions, mental status, and medical status. Within each category, specific criteria are assigned to a level of care. A client may be independent in one category and dependent in another. In this case, it is the judgement of those doing the assessment that decides on an overall level of care. Criteria for level one includes an individual that may require minimal assistance with personal functions such as bathing and toileting and may be independently mobile with or without aids; may have mild difficulties with memory or orientation; and may have medical problems which are

stable. Individuals meeting criteria for level two may require moderate assistance with personal functions such as bathing and will require assistance with toileting to maintain cleanliness; may have moderate cognitive impairment and need assistance in understanding and expressing needs. They may also need therapies which require assistance to complete and professional monitoring. An individual meeting criteria for level three may be dependent for mobility and may have incontinence of bladder and/or bowel; may have severe cognitive impairment and behaviour problems; and may have medical problems that require continuous supervision and frequent intervention. Criteria for level four includes individuals who are fully dependent and may need a medical device or intervention to compensate for a loss of a vital function.

The Region's institutional LTC sector is divided into NHs and PCHs. NHs contain beds of all levels and PCHs contain level one and two beds. SC refers to all level one beds in NHs and all PCH beds. Level two, three, and four beds in NHs are defined as NH care. Clients entering NHs should require professional nursing care, however some clients are admitted to NH beds with lower level care needs. The NHs are located in the city and they include a small number of beds for clients with modest disability who do not require the professional services of a NH. The PCHs are largely outside the city of St. John's and are almost all for-profit facilities. However a government subsidy is provided to clients who are unable to pay for private care. Costs for LTC are shared by the individual and the province. Before a client enters a LTC facility, a financial assessment is carried out to determine what portion, if any, the individual is able to pay for their care.

Several studies have been conducted through the PRC in St. John's evaluating LTC. In 1995, the Provincial Department of Health and Services sponsored a regional review of the LTC sector to aid in future planning.

In 1995, when single entry was first introduced to the St. John's region, clients were placed on a waitlist for LTC. The assessment records of all clients who were approved for placement, as well as those on a single waitlist on a given day were reviewed. The investigators in the PRC used objective criteria to determine the LTC needs of this group and forecasted annual demands for institutional LTC in St. John's. Findings in this study showed that 29% of clients who were recommended to SC by a panel could be managed with community based services alone. There was variation in waiting times to placement, largely influenced by the location of care sought by the client. Access to PCHs provided SC in a timely manner, but applicants waited many months for entry into NHs (O'Reilly, Parfrey, Barrett, & McDonald, 1998).

In 2002, another study was completed on the 1995/96 incident cohort. This study looked at the 4-year follow-up of these clients and evaluated client characteristics, the level of disabilities, where the clients were placed, and the natural history of the LTC clients. This study concluded that if current methods of placing individuals into LTC continued to be used, a bed deficit would occur. If optimal methods of placement were used, bed surpluses would occur. The importance of CI as a special group and the need for more supportive facilities was discussed (Reddy, 2002).

The Western and Labrador regions were compared to the St. John's Region. This study suggested that alternate facilities for clients with CI may reduce inappropriate placement into NH beds (Stuckless, 2000).

These studies provide a large amount of information on LTC in the St. John's region. They enhance the published literature on LTC as no other studies conducted within a provincial region, with these objectives and specific research questions, were obtained. Although they were conducted over time, there has been consistency in that they have all been conducted from the PRC in St. John's. More recently, the Clinical Epidemiology group in the PRC have published a study comparing the type and annual rate of clients seeking placement to LTC in five provincial health regions (Hughes, McDonald, Barrett, & Parfrey, 2008).

2.4 Methods of Needs Assessment

2.4.1 Resident Assessment Instrument/ Minimum Data Set.

Comprehensive knowledge of a resident's physical, mental and emotional capacities is essential for the appropriate provision of LTC (Hawes, Morris, Philips, Mor, Fries, & Nonemaker, 1995; Kontos, Miller, & Mitchell, 2009; Morris, et al., 1990). The Omnibus Budget reconciliation Act of 1987 in the United States resulted in congress mandating a national resident assessment system. In 1990, the Resident Assessment Instrument (RAI) was specified as the government's uniform instrument to assess all residents in NHs (Hawes, Morris, Philips, Mor, Fries, & Nonemaker, 1995; Wodchis, Naglie, & Teare, 2008). The RAI consisted of two components. The first component was the Minimum Data Set (MDS). The MDS was defined as a set of core items, definitions,

and response categories necessary for a comprehensive assessment of all residents in NH facilities. Resident Assessment Protocols (RAPs) made up the second component of the system. RAPs provided guidelines for a more detailed assessment of the 18 conditions that affect the well-being of a client in a NH. The RAPs were completed on clients who were identified on the MDS (Hawes, Morris, Philips, Mor, Fries, & Nonemaker, 1995; Morris, et al., 1990).

The RAI/MDS provides the core framework for interdisciplinary care planning across North America and abroad (Hawes, Morris, Philips, Fries, Murphy, & Mor, 1997; Kontos, Miller, & Mitchell, 2009). The MDS is used in over 20 countries for LTC planning, policy and research purposes (Wodchis, Naglie, & Teare, 2008), including to varying degrees in Scandinavia, Japan and most of Western Europe (Hirdes, 1997). Three studies will be discussed that have described the recent developments of the RAI/MDS.

The quality of the information recorded on the MDS has not yet been assessed. (Wodchis, Naglie, & Teare, 2008). A study conducted in Canada examined the quality of diagnosic coding on the MDS. This study included 80,664 subjects who were admitted to Ontario Complex Continuing Care (CCC) directly from acute care hospitals between 1997 and 2005. Using a previously validated discharge abstract database (DAD) as a reference standard, the sensitivity for capturing each diagnosis on the MDS was calculated (Wodchis, Naglie, & Teare, 2008). This sensitivity measured how well the MDS captured each diagnosis compared to the DAD.

The authors concluded that the majority of diagnoses with the highest prevalence as an acute care primary diagnosis had sensitivity values of at least 0.8. However, the sensitivity was lower when considering all diagnoses, suggesting an underrecording of secondary diagnosis on the MDS. On the other hand, it is possible that the DAD overcodes the diagnoses in CCC. In addition, there could be incomplete information in the transfer notes that pass from acute care to CCC, or some of the diagnoses could have resolved before the CCC admission. This study stressed that information about a client should be more integrated across health care providers and that improved processes to record complete and comprehensive information about an individuals health, at the point of transfer from acute to chronic care, is required. The authors concluded that researchers should be cautious about MDS diagnoses when identifying patient populations (Wodchis, Naglie, & Teare, 2008).

This study evaluated an important process used in LTC. However, only patients who recently required acute care were included. Although this would include many of the clients who enter LTC, it does not include all of them. Clients who enter from the community may have a different collection of diagnoses and functional problems. In addition, the vehicle of transfer of information would also be different as acute care records would not be used in this case. Impact of these differences on the validation of diagnostic information is unknown.

The RAI/MDS has also been shown to undermine quality care when used exclusively to assess clients in NHs (Kontos, Miller, & Mitchell, 2009). Features of daily resident care are dependent on activities of personal support workers (PSW) as they

provide 80-90% of all direct care (Casper & O'Rourke, 2008; Kontos, Miller, & Mitchell, 2009). A qualitative study utilized focus groups and interviewed 26 PSWs and nine supervisors to examine the decision making and care practices of PSWs in relation to the RAI/MDS standarized process (Kontos, Miller, & Mitchell, 2009). The results showed that as a result of their proximity and bonds of kinship to residents, PSWs provided valuable contributions to assessment which are not captured by RAI/MDS. This process focused only on medical issues and not psychosocial well-being or personal preferences. In addition, this has important implications for clients with dementia, where individual preference and personal history are critical in individualizing care and interpreting their complex behavior. The authors recommended that PSWs should not be underestimated and that their knowledge should be included in care planning (Kontos, Miller, & Mitchell, 2009).

A family of assessment instruments, called the interRAI, were constructed to be used in a variety of vulnerable populations. The first one constructed was the RAI described above. Since that time, a number of them have been released including RAI-Home Care, RAI-Mental Health, RAI-Post-Acute Care, RAI-Palliative Care and RAI-Long Term Care Facility. The development of these were all guided by the original principles of RAI.

The reliability of these instruments was assessed in a recent study (Hirdes, et al., 2008). Trained assessors conducted paired assessments, 72 hours apart, on 783 individuals across 12 nations. The assessors were blinded to the others' assessment and an analysis was performed using a Kappa statistic. The refined versions of these

instruments demonstrated substantial reliability and it was concluded that they provide a scientific sound system to be used in decision making. This step was important in achieving national standards of assessment, however, validity studies will need be conducted in the near future (Hirdes, et al., 2008). Another research effort that has been underway is the refinement of assessment protocols to be used with all the new instruments. Such international endeavors are few, and have only been seen for standards such as the World Health Organization's International Classification of Disease and the Diagnostic and Statistical Manual for psychiatric conditions (Hirdes, et al., 2008).

In 2000, interRAI initiated a multinational effort to develop new instruments and update the entire existing family of RAI instruments (Hirdes, et al., 2008). They used 70 common items that would be relevant to all instruments. They subsequently identified 100 optional items and a number of specialized items that were added if they were relevant to that specific instrument. These new instruments included those for NHs, assisted living, supportive housing, and community mental health, to name a few (Hirdes, et al., 2008).

2.4.2 Case-Mix Classification System for Long Term Care.

A great deal of literature published over a decade ago, discussed the use and validation of case mix classification systems. *Case* refers to NH residents, classified according to their characteristics. *Mix* refers to the mixture of different types of residents in NH facilities. A case mix classification system has two components. One is clinical information about the residents and the second is the amount of nursing time associated with caring for these residents (Zbylot, Job, McCormick, Boulter, & Moore, 1995).

The allocation of funding to LTC should be based on an accurate assessment of the financial requirements of each LTC facility and their clients. These financial requirements as well as the kind of care provided to clients depends on the resource needs and clinical complexity of the clients living in these facilities, which dictate the quality and quantity of nursing care required. In addition, appropriate placement of clients into LTC is required to efficiently utilize resources and provide the most suitable environment for the well being of the frail elderly. For the most appropriate provision of LTC, an objective assessment tool is essential.

Two classification systems were constructed to identify an appropriate case mix measure primarily for the purposes of allocation of funding and identifying client needs for appropriate provision of LTC. These two case-mix systems included the ARCS and the RUGs-III. Case mix has also been used by facilities as a management tool (Fries et al, 1994) and by researchers for LTC planning (Hughes, McDonald, Barrett, & Parfrey, 2008; O'Reilly, Parfrey, Barrett, & McDonald, 1998; Reddy, 2002; Stuckless, 2000).

2.4.3 Resource Utilization Groups - III.

The MDS has been used to construct RUGs that use a combination of client characteristics that group them according to patterns of resource utilization. RUGs is a hierarchical system based on clients' clinical status and assigns clients to one of seven groups ranked according to cost (Fries, Schneider, Foley, Gavazzi, Burke, & Cornelius, 1994; Hirdes, Botz, Kozak, & Lepp, 1997). This classification consists of clients being grouped into clinical categories, including special rehabilitation, extensive services/special care, clinically complex, cognitive impairment and/or behavioural

problems, or reduced physical function. The client is also assigned an activity of daily living (ADL) score that assigns them a case-mix index representing their relative resource needs. Clients can qualify for more than one group, but are placed in the most resource intensive one (Carpenter, Main, & Turner, 1995).

The most recently improved version, RUGs-III, recognizes important variables such as residents with CI, residents requiring high technological procedures and rehabilitation, and the use of more appropriate activities of ADL indicators. It results in better stratification of residents (Fries, Schneider, Foley, Gavazzi, Burke, & Cornelius, 1994). It was developed to identify the unique combination of client characteristics that resulted in differential patterns of resource utilization.

With financial limitations and public pressures for a more efficient LTC system, there has been growing interest in a more appropriate allocation of funding and provision of care in Canada. With population aging, a study hypothesised that the health care needs of Canadians was changing. To address them adequately in the face of limited resources, there was a need for Canadian resources to be distributed in the most appropriate way. This was observed in a pilot study in Ontario that resulted in the implementation of the RUGs classification system for measurement and funding of chronic care patients (Hirdes, Botz, Kozak, & Lepp, 1997).

2.4.4 Alberta's Resident Classification System.

The ARCS was constructed in 1988 as a result of the Alberta Nursing Home Review Panels' desire to improve LTC (Armstrong-Esther, 1994). One key objective of ARCS was to provide a systematic method of measuring the nursing requirements of

residents in NHs and auxiliary hospitals. Another objective was to assist the Alberta government in deciding whether to move towards a case-mix payment system by providing case mix information (Charles, 1998). This new classification system measured the nursing requirements of LTC clients and provided case mix information for a new funding system.

Prior to the ARCS, a linear model of care was present where the level of dependency increased as clients got older and as they went from community living to an auxiliary hospital. However, the practice of maintaining and supporting people in the community for a longer period increased the level of care of clients entering institutions. The global budgets were no longer suitable as the gap between the dependency of clients in NHs and those in auxiliary hospitals was decreasing (Armstrong-Esther, 1994). Hence, ARCS was also driven by the desire for a more integrated and flexible continuum of care such that clients who changed care requirements could stay in the same facility instead of relocating (Armstrong-Esther, 1994; Charles, 1998).

The ARCS is based on disabilities associated with time needed for the delivery of care. Eight indicators reflecting care requirements in three care domains (activities of daily living, behaviours of daily living and continuing care levels) are used to classify residents (Charles, 1998). Scores on each indicator are combined to give a score for each domain, and these are combined to give an overall level of care. These are ranked A to G, from low to high, in terms of nursing time equivalents. A case-mix index is constructed using information from the classification system to develop a measure of quantity of care relative to other clients and/or facilities (Charles, 1998).

2.5 The Cognitively Impaired - A Special Group

The risk of dementia increases with age and since the population is aging, there has been an increase in the number of individuals with more severe levels of dementia. LTC facilities house more residents with CI than they did in the past (Chappell & Reid, 2000; Gaugler, Yu, Krichbaum, & Wyman, 2009). Higher rates of moderate to severe dementia exist for clients 85 years and older in North America compared to Asia and the United Kingdom and Europe (Rockwood & Stadnyk, 1994). However, one difficulty is that the prevalence of CI is dependent on its definition and knowing exactly when CI interferes with functioning is difficult (Roos & Havens, 1991). There has been debate on dementia prevalence, likely a result of variable definitions and classifications of CI, e.g. CI without dementia (CIWD) and dementia - mild, moderate and severe forms (Graham, et al., 1997). The description and measurement of CIWD has been one of the largest challenges in dementia epidemiology (Graham, et al., 1997). It appeared from reviewing the literature on this topic that the terms CI and dementia are sometimes used interchangeably and the definitions and criteria for each are not always clear.

A recent American study stated that 48%-55% of NH residents were cognitively impaired and 14% of these had Alzheimer disease (Gaugler, Yu, Krichbaum, & Wyman, 2009). Based on information collected in The Canadian Study of Health and Aging, Graham, et al., (1997) published a study on the prevalence of CI with and without dementia in the elderly. They reported that 16.8% of all Canadians had CI and 8% had dementia. Also, the prevalence of all CIs and dementias were 65% in those 85 years and

older. Among those who lived in institutions, 30% had CI and 56% had some form of dementia (Graham, et al., 1997).

Older studies have also assessed the prevalence of CI and dementia in Canada. Clinically significant CI in Saskatchewan was found to be 7.8% in communities and institutions (Roos & Havens, 1991). The Manitoba Longitudinal Study on Aging estimated mild CI to range from 13% to 17% and moderate to severe CI to be almost 7% (Robertson, Rockwood, & Stolee, 1989). A small study in Edmonton found that the prevalence of mild CI in the community was 3.3% and 29.1% among institutional clients. In addition, almost 40% of clients in the institutions were considered to have severe CI (Bland, Newman, & Orn, 1988).

These studies were produced from different populations and study types, so direct comparison among them is difficult. No Canadian study was found that provided a more recent overview of the prevalence of CI in the community or within LTC. However, there was no doubt that in recent times, the cognitively impaired comprise a substantial proportion of the population, just as they do in the United States as reported by Gaugler, Yu, Krichbaum, & Wyman (2009). This is especially true in LTC facilities. Specific research on how CI is defined as well as the recent prevalence across Canada would add to the literature on this topic.

Many studies have shown that clients with CI and dementia have special needs and that their health care workers are often faced with unique challenges (Feng, et al., 2009; Gnaedinger, 2003; Grant & Potthoff, 1997; Rockwood, Stolee, & Robertson, 1988; Schindel-Martin, Morden, Cetinski, Lasky, McDowell, & Roberts, 2003; Young, Binns,

& Greenwood, 2001). Different environments have been suggested for the most appropriate care of clients with CI.

In Canada, a model of care for those with CI called *resident-centred care,* has been embraced by leaders across the country (Gnaedinger, 2003). This model was initially based on success in Sweden and Australia. However, in Canada there have been problems implementing this model. The goal was to create a natural daily rhythm, where the clients preference and personal history is taken into account. This model included changes in architectural design, programming and staffing patterns. It involved the transfer from a highly scheduled and task oriented approach to a flexible, resident-centred approach that was more social and less medical (Gnaedinger, 2003). Increased flexibility, smaller living arrangements, a greater continuity of staff and their assignments, and increased formal involvement by *all* front line staff could decrease the residents' agitation, increase their social interactions and provide a more home like environment (Gnaedinger, 2003).

However, this model had several challenges. In this context, a study was conducted in British Columbia to understand the workers' experience and assessment of this new model of care, to assess how it was practically being implemented, and to contribute to policies that help to improve the environment for both residents and staff in dementia care. One challenge was that although multi-tasking for greater continuity of care lead to increased flexibility, it was challenging to accomplish in larger environments with greater distances to travel. Important components of this new model were clustering residents in small groups to increase interaction, reducing noise, and providing a home

like environment, all of which were also challenging when the facility was large. Another challenge was that some residents were much more medically complex and required higher level needs than residents 10-20 years ago when this model was first developed in Sweden.

Overall, many challenges were identified and recommendations were made. Recommendations included an increased staff-to-resident ratio, ongoing education, and further team work. This model would be difficult to implement in large LTC facilities. These environments should be modified to smaller clusters of residents, with all the amenities of a home.

The negative behaviours of cognitively impaired residents in NHs are often managed with physical restraints and antipsychotic use (Feng, et al., 2009). The frequent use of restraints are associated with negative consequences and are highly discouraged unless ordered by a physician. The negative consequences of use of various psychotropic medications are also well established and are of concern. A reduction in the use of these aids could occur if alternatives were available. This study suggested that new staff models and education programs targeted at how to deal with these problems could help achieve this reduction (Feng, et al., 2009).

It has been shown that even meal delivery practices did not meet the needs of patients with increased cognitive and behavioural difficulties in LTC facilities (Young, Binns, & Greenwood, 2001). Residents in a home for the aged in Toronto, Ontario were studied and it was found that the traditional practice of feeding the elderly was not the most appropriate. These individuals were often malnourished. Providing the least energy

dense meals in the morning and the most energy dense meals for dinner was counter to the responsiveness exhibited by clients with CI and behavioural problems (Young, Binns, & Greenwood, 2001). Researchers found that these clients no longer displayed eating habits similar to young healthy adults, but were most responsive to food in the morning. These findings were significant for clients since under-nutrition was a predictor of poor morbidity, poor mortality, and increased progression of disease in Alzheimer's patients (Young, Binns, & Greenwood, 2001).

10 - 50% of the population residing in LTC facilities displayed some form of physical agitation and aggression. A randomized controlled trial was carried out in Hamilton, Ontario to study the effect of staff training and the response to clients with CI. Staff not formally trained in this specific area consistently reported feeling at high risk for injury and expressed concern over how to deal with some behaviours (Schindel-Martin, Morden, Cetinski, Lasky, McDowell, & Roberts, 2003). Staff trained in a 7.5 hour program demonstrated increased knowledge and a higher skill level than those not trained. It was clear that nursing skills are not always needed with this type of patient, but instead a number of skill development clinics would be an efficient educational tool (Schindel-Martin, Morden, Cetinski, Lasky, McDowell, & Roberts, 2003).

More than two decades ago, problem behaviour which occurred in elderly clients of LTC facilities was acknowledged in Saskatchewan (Rockwood, Stolee, & Robertson, 1988). At that time, 990 elderly LTC residents were surveyed and it was found that problem behaviour occurred daily in 21% of residents and weekly in an additional 8%. Problem behaviours were higher in clients with higher levels of CI (Rockwood, Stolee, &

Robertson, 1988). Even at this time, there was pressure to establish separate, specialized units for the care of these residents.

A study conducted by Grant & Potthoff (1997) showed that clients participated more in activities and programs in Special Care Units (SCUs) compared to non-SCUs. SCUs are segregated units for the cognitively impaired with programs that are more specifically geared towards them. These included increasing family involvement, paying greater attention to past habits, occupational roles, and assessing residents comprehensively to better match activities to memory, language, and attention (Grant & Potthoff, 1997). Advocates call for this different approach to program development because they believe it will improve quality and efficiency of care. This improvement appears to be the motivation for increased development of SCUs in Minnesota (Grant & Potthoff, 1997). It was argued that a lack of separation of clients was detrimental to the cognitively intact. They suggested there were benefits to developing activity programs to meet the needs of the various levels of cognitive and functional impairment (Grant & Potthoff, 1997). Some facilities had created multiple SCUs for different stages of dementia, because they believed that programs could be organized to better meet the needs of demented clients.

An increase in aggressive and violent behaviour has increased in LTC facilities in the United States, United Kingdom and Canada, largely as a result of the growing number of the LTC population with dementia (Boyd, Mitchell, & Malm, 2009). A British Columbia study looked at five NHs to assess LTC violence and methods which could decrease or prevent it. Relevant highlights included marked improvements in education,

setting new guidelines for the management of dementia and aggressive behaviour, as well as simple physical changes to the living areas, such as reducing noise levels and rearranging furniture to decrease congestion. These all had a positive impact on decreasing negative behaviour, decreasing the stress of workers, and increasing the general morale of many clients and staff in these facilities (Boyd, Mitchell, & Malm, 2009).

Multiple predisposing factors were found to be associated with delirium among LTC residents with dementia in a recent cross-sectional study in Quebec (Voyer, Richard, Doucet, & Carmichael, 2009). Identifying these factors would help nursing staff detect who is at risk. Delerium is an important syndrome to prevent as it is associated with negative outcomes such as a decline in functional status and increased mortality rates. This study concluded that factors such as pain, depression, behavioral disturbances, dehydration and fever were associated with delirium (Voyer, Richard, Doucet, & Carmichael, 2009). Teaching staff how to recognize these factors and designing preventative strategies may decrease the occurrence of delerium. However, recognizing risk factors such as pain and depression among the cognitively impaired can be very challenging (Voyer, Richard, Doucet, & Carmichael, 2009). This may be better excecuted in a specialized facility for those with CI where all staff deal with this same problem and education can be specifically directed towards them. Staff who deal exclusively with these clients would likely become more skilled over time at recognizing these factors.

2.6 Summary

Population aging is significant and the demands for LTC have increased. LTC is primarily a provincial responsibility and because of this, there is much variation in the provision of LTC across Canadian provinces. Nonetheless, a single entry system has been implemented in most provinces and has contributed to better matching of clients' needs to services. Most provinces are active in LTC restructuring, many of which have launched strategies with specific initiatives to improve LTC in their province. It is important to recognize that clients with CI have special needs in the context of LTC and that this group makes up a substantial proportion of clients living in LTC facilities.

In the St. John's Region, the need for LTC has been studied over the last several years. A single entry system was implemented in 1995 with the intention to more appropriately place clients in NH or SC beds. A significant number of clients placed in NH beds could be managed with SC only. However, with almost no other options other than NH beds in the city of St. John's, a bed crisis is likely to occur if restructuring does not take place. As of 2004, the St. John's region had yet to remodel LTC to better suit these clients and to efficiently allocate limited resources.

Chapter 3

Design and Methods

This chapter will focus on the design of this project and the methodology used to carry out this study. A background will be given summarizing the research work that has been completed which provides a foundation on which this study is based. The research design will be discussed and the sample selection including inclusion and exclusion criteria of all research groups will be listed. The study populations will be summarized and relevant ethical considerations will also be given. In addition, the research instruments used in this project and their appropriateness will be briefly discussed. The procedure and information on data collection will be provided. This project used a decision tree constructed by researchers, to suggest optimal placement of LTC clients. The decision tree will be described in this section. Finally, an overview of the statistical analysis performed during this study is discussed as well as the assumptions used in projecting future LTC needs.

3.1 Background

In 1995/96, the annual institutional LTC needs in the St. John's region were studied by the PRC. Data was collected on clients seeking placement into institutional LTC from February 20, 1995 to February 20, 1996. The data was obtained from Community Health St. John's Region. The number of clients included in this analysis was 426, and is referred to as the 1995/96 annual incidence cohort. The ARCS and RUGs-III objective classification systems were used. A waitlist cohort was obtained as well of all clients on the waitlist for LTC placement on May 14th, 1996. This list included

181 cases. This study identified the annual demands on the LTC sector, and the efficiency with which the system operated.

Using the1995/96 incident cohort of clients entering LTC, clients were followed annually for four years to obtain outcomes. Information such as mortality, degree of disability, time to placement, and change of care levels were collected. Based on the history of these clients, an estimate of the demand for LTC beds was projected for 2006.

A cross sectional study on residents already residing in institutional LTC in the St. John's region was carried out in 1997. Using the objective classification systems, the appropriateness of LTC placement at this time was reviewed.

In January 2001, the St. John's Nursing Home Board/Provincial Department of Health commissioned the Clinical Epidemiology Group to repeat the study done in 1995/96 within the St. John's region. Clients entering the LTC system for placement during the 1999/2000 years were studied. This group, called the 1999/00 annual incidence cohort was followed for one to fours year to collect data such as degree of disability, time to placement, and recommended level of care. This study was used in conjunction with the previous one to make more accurate predictions of demand for LTC and to compare characteristics of the LTC population such as degree of disability and mortality.

In 2003, a cross sectional study was carried out on residents residing in NHs in the St. John's region. This was conducted similarly to the cross sectional study done in

1997 on the residents residing in NHs in the St. John's region and was used to compare any changes in case mix that had occurred over time.

In this thesis, data from the two incident cohorts and the two cross sectional studies were evaluated.

3.2 Research Design

In the two incident cohorts of new clients who applied for placement in the St. John's region in 1995/1996 and 1999/2000, demographic characteristics were collected, and clients were assessed using (a) RUGs-III classification; (b) ARCS classification; (c) a four-year annual follow-up of the 1995/1996 cohort and a one to four-year follow-up of the 1999/2000 cohort. The RUGs-III and ARCS scoring systems were used to measure client needs, and accurate outcome data was obtained to determine longevity.

The following outcomes were evaluated:

- Annual incident rate of clients seeking placement into LTC;
- Evaluation of 1997 and 2003 prevalent cohorts to assess the single entry system;
- Demographic and clinical characteristics of the two annual incidence cohorts, 1995/96 and 1999/00;
- Appropriateness of client placement;
- Time to placement;
- Factors predictive of time to placement;
- Mortality;
- Factors predictive of mortality;

- Panel recommendations versus optimal placement as defined by a decision tree;
- Mortality of the 1995/96 and 1999/00 cohorts as defined by optimal placement;
- Annual demand for LTC;
- Future demand for LTC.

3.3 Sample Selection

3.3.1 Incident Cohorts.

3.3.1.1 Inclusion Criteria

Clients were included if:

- They contacted Community Health St. John's Region for LTC institutional placement in the St. John's region during the year 1995/96 and 1999/00 and were subsequently assessed by the single entry panel.

3.3.1.2 Exclusion Criteria

Clients were excluded from the study if:

- Their chart was missing;
- They did not go to a LTC home when offered placement; thus their application was defined as precautionary;
- They were transferred from one institution to another;
- They were referred from out of region.

3.3.2 1997 and 2003 Resident Populations.

3.3.2.1 Inclusion Criteria

Clients were included if:

- They were residents in one of the six nursing homes in the St. John's Region on one chosen day.

3.3.2.2 Exclusion Criteria

Clients were excluded if:

- They were admitted for respite (temporary placement of < four week period);
- or they died before client interviews with the charge nurse after the initial enrollment.

3.4 Study populations

3.4.1 1995/96 Annual Incident Cohort.

467 clients were seeking placement into long-term care in 1995/96. No data was available on 41 of them, leaving 426 clients eligible for the study. 84% of these clients (357/426) were included in this analysis following exclusion of clients who were precautionary, were referred out of region, or withdrew prior to placement (n=69) (Figure 3.1).

3.4.2 1999/00 Annual Incidence Cohort.

464 clients were seeking placement into LTC in 1999/00. Data was unavailable on 31 of them. Of the remaining 433, 30 were either precautionary, referred out of region or withdrew. The final group used in this analysis was 403 (Figure 3.2).

3.4.3 1997 and 2003 Nursing Home Resident Population.

98% of the total study population was included in the final analysis. 1044 clients were included in 1997 and 963 were included in 2003.

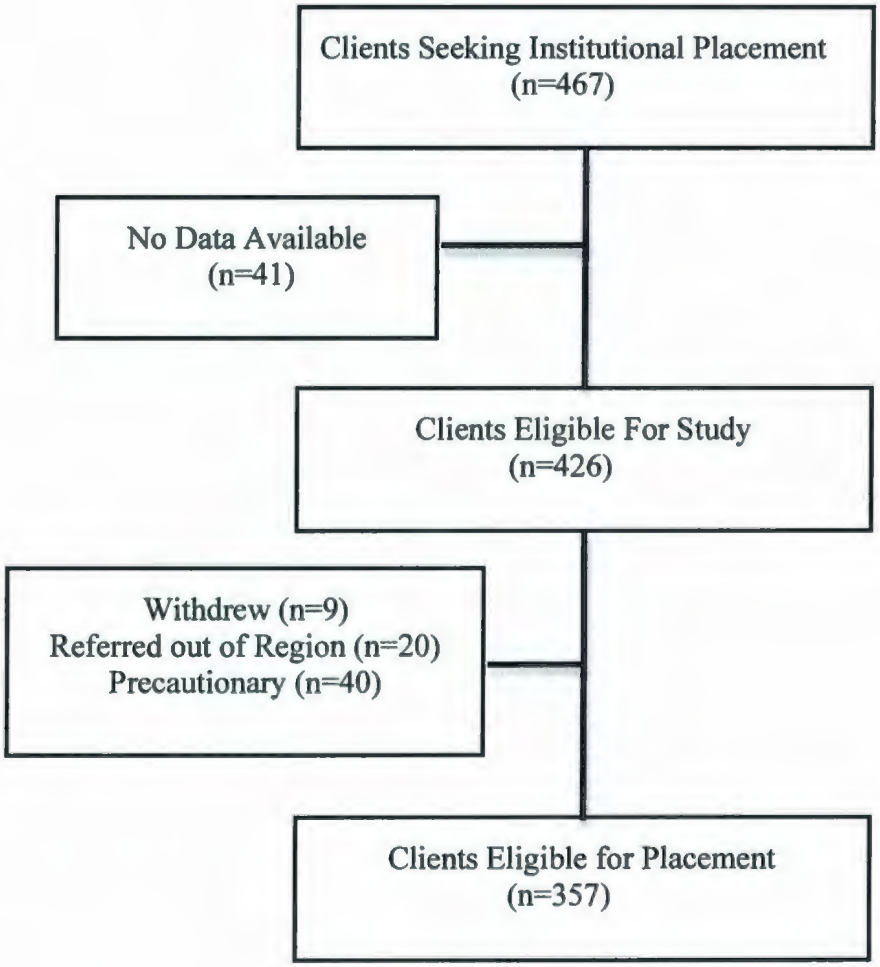


Figure 3.1. Study cohort of 1995/96 (n=357)

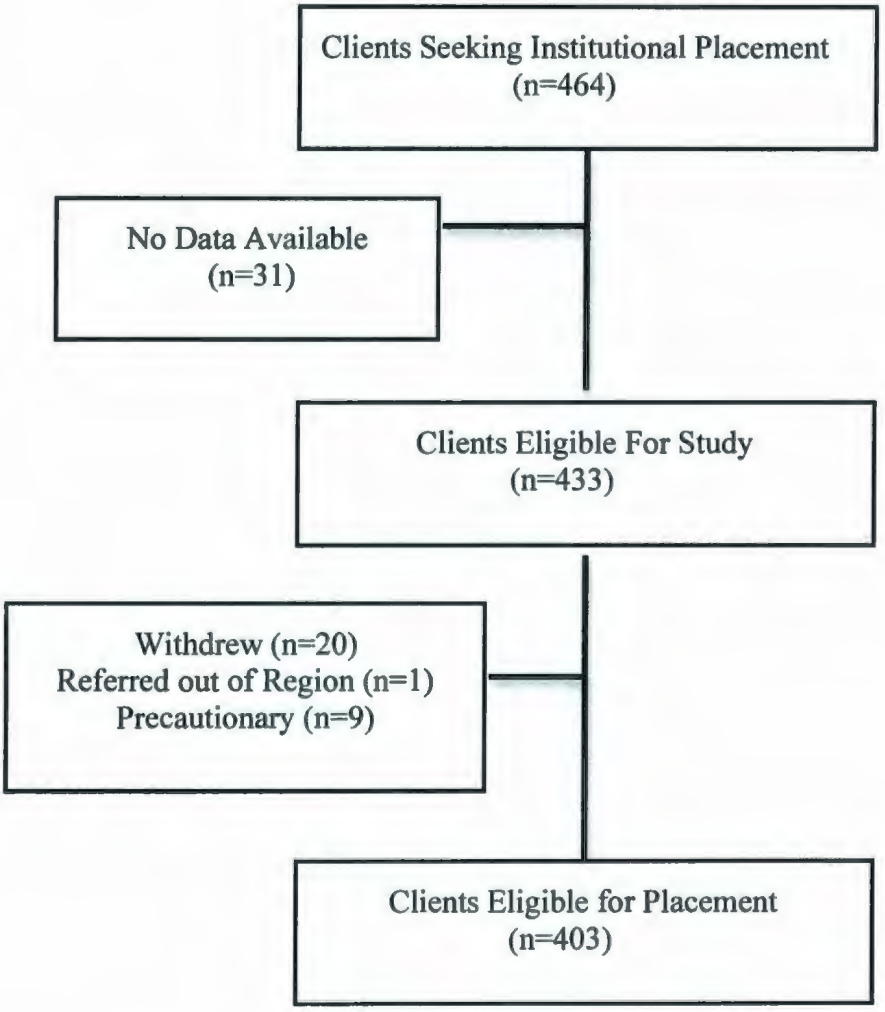


Figure 3.2. Study cohort of 1999/2000 (n=403)

3.5 Ethics

The Human Investigations Committee of Memorial University of Newfoundland approved this study. Relevant information was obtained by chart abstraction, nurse observations and interviews, and was recorded on a data collection form. Informed consent was not required because this procedure did not require patient participation. Confidentiality was maintained through the absence of client identifiers on all study documents and reports.

3.6 Research Instruments

To effectively measure the care requirements of clients requesting institutional placement, two primary classification systems were used.

3.6.1 Alberta Resident Classification System.

The Alberta Resident Classification System (ARCS) incorporates data from 3 domains: activities of daily living, behaviours of daily living, and continuing care indicators. A score was given on each of eight indicators including eating, dressing, toileting, transferring, ineffective coping, potential for injury to self and others, urinary and bowel continence. These scores were combined using rules that placed a client in a specific level of care between A and G. Each level above A represented a higher level of required resource use, measured by nursing time equivalent per day. Nursing time equivalents were A = 1.00, B = 1.40, C = 1.93, D = 2.26, E = 2.90, F = 3.40, G = 3.86 (Appendix III).

3.6.2 Resource Utilization Groups-III.

The RUGs-III classification system is used to assess the medical complexity and clinical characteristics of the clients. This system classifies clients by assigning them to one of seven hierarchical groups, ranked according to cost. These main groups include rehabilitation, extensive services, special care, clinically complex, impaired cognition, behavioral problems, and reduced physical function. It is assumed that all groups require professional care such as that provided in a NH. Using this classification system, combinations of characteristics lead to different patterns of resource utilization (Appendix IV).

3.7 Appropriateness of Research Instruments

3.7.1 Alberta Resident Classification Score.

The ARCS was first constructed to take account of the impact of case mix on human resource utilization in making decisions for NH facilities. It was also felt to have a role in outcome measurement such as providing objective data assessing appropriate LTC placement, although was not constructed for this purpose. Limitations of the ARCS include the fact that it was implemented to include not only the elderly but assessment of young physically handicapped clients. In addition, because it classifies clients according to level of disability and not directly on the need for professional nursing care, it may be biased as it goes beyond case-mix to include variations in client needs due to competence of care providers. However, it is a validated instrument for determining requirements of care and an objective assessment of the process of placement into LTC (Armstrong-Ester

et al, 1994). The ARCS was used to assess both incident cohorts and so therefore internal validity and consistency was maintained.

3.7.2 Resource Utilization Groups-III.

The primary purpose of RUG's-III was to specifically measure day to day resource use in the LTC of the elderly for case-mix funding as opposed to assessing clients for placement decisions (Carpenter et al, 1995). Although this tool has been validated across a range of populations, it was constructed for use in NHs in the United States. RUGs-III explains staff time of nurses and aides, but it is not known if it also describes other measures of resource use, such as ancillary services and other staff. However, this instrument is designed specifically for the elderly and it is assumed that our NH population is comparable to the United States and therefore can be applied to our population. RUG's-III was used to assess both incident cohorts and therefore internal validity and consistency was maintained.

3.8 Procedure

3.8.1 Process of Long Term Placement - St. John's Region.

The project began once approval was received from the Human Investigations Committee of Memorial University in 1995. A list was obtained of all clients seeking long-term institutional placement from Health and Community Services during the year 1995/96. This process was repeated again in 1999/2000.

Clients seeking placement into LTC were first evaluated by an assessor (i.e, nurse or social worker) using the provincial assessment form Newfoundland and Labrador

Continuing Care Assessment for adult LTC (NLCCA). This form includes information such as demographics, ADL, informal supports, and clinical problems. The assessor presented a summary sheet to a decision panel at Health and Community Services on each client with a recommendation for placement based on a combination of the collected data and the clients' requests. The panel made a final decision regarding the recommended placement of the client based on the assessor's recommendation and the level of care they felt the client required. Clients were classified by a level of care between one and four, and recommended into either a (Figure 3.3):

- PCH (level 1 or 2)
- NH (level 1, 2, 3, or 4)

Clients were then put on a waitlist for placement into the recommended LTC facility.

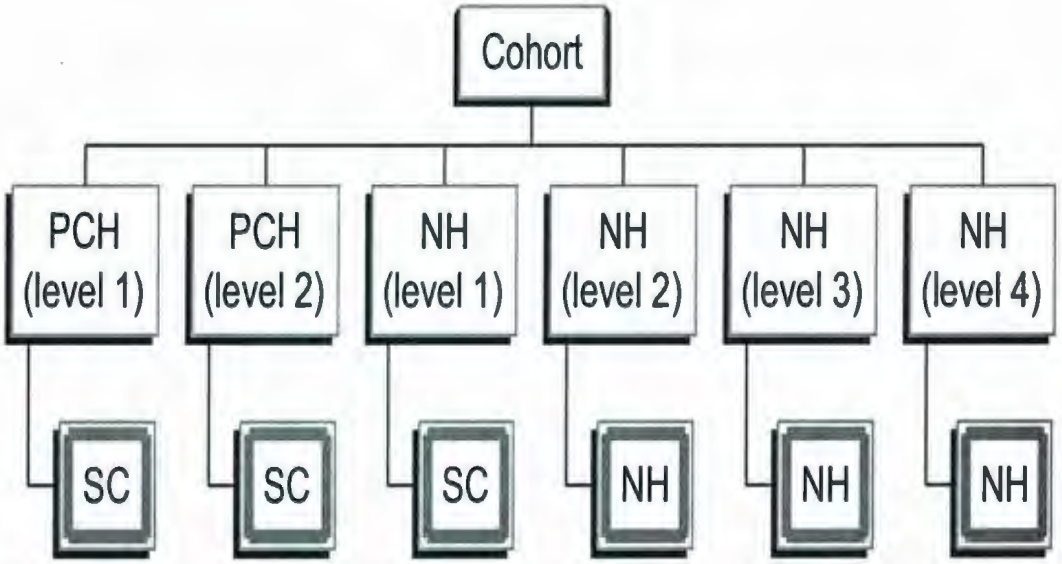


Figure 3.3. Classification of Panels Recommended Placement into Supervised Care (SC) or Nursing Home (NH), by Level of Care.

SC = Supervised Care; NH = Nursing Home; PCH = Personal Care Home.

3.8.2 Data Collection.

3.8.2.1 Incident Cohorts

The PRC research team used ARCS and RUGs criteria, described previously (section 3.6.1, 3.6.2) to classify the degree of disability and need for professional care provided in a NH, respectively. Relevant data from the NLCCA was extracted by the research team and recorded on a Long Term Care Classification Worksheet. This data collection instrument was developed by the researchers in 1995 to combine important factors from each of the classification systems. In 1999/00, a similar worksheet was used. The ARCS and RUGs-III category for each client was then entered into a database.

Demographic information was also recorded in a database including such items as the clients' sex, age, area of residence, and location at application. The availability and capability of home support was also estimated from information on the original assessment form. To obtain information regarding the updated status of a clients' application, minutes from the Assessment and Placement meetings were provided from Community Health St. John's region.

A four-year follow-up of the 1995/96 cohort was previously conducted to obtain annual outcomes such as placement dates, level of care and mortality dates. In 2001, an investigation of the 1995/96 final outcomes was completed. New mortality dates provided by Statistics Canada were updated. The 1999/00 cohort

was followed up for one year after the panel date - the date the client was first assessed, to obtain similar outcomes. In 2003, data was collected on 220 of the clients in 1999/2000. Hence, all clients in both cohorts were given a final outcome using date of death or last follow up.

3.8.2.2 Prevalent Groups

In 1997 and 2003, data was collected on the NH resident population who were living in each facility during the time of study. Two research nurses abstracted the demographic and clinical information included in the medical records and the nursing care plans. Following this, the charge nurse of each unit was interviewed to determine appropriate scores for both ARCS and RUGs clinical indicators.

3.9 Optimal Placement - Decision Tree

Using a decision tree formulated by the research team based on the ARCS (level of disability), RUGs (clinical need for NH care) and presence or absence of CI, optimal placement was determined. Thus this algorithm (Figure 3.4) classifies clients objectively as to the most appropriate placement based on needs, but cannot account for the other subjective criteria which may have been known to the single entry panel. In addition, the research team assumed, as the single entry panel did, that LTC was required in all cases, excluding the possibility of continuing in the community with supports.

The ARCS was used to score the clients with regard to their level of disability and resource requirements. Clients with scores of 1 or 2 were grouped as low resource needs

(similar to level 1 care); scores 3, 4, or 5 were grouped as moderate resource needs (similar to level 2 care); and scores of 6 or 7 were considered high resource needs (similar to level 3 care). Clients in the high resource needs category were automatically qualified for NH placement.

The optimal placement of clients in the low and medium level of disability was further grouped by whether or not they had RUGs indicators for NH care. If RUGs indicators were not present, the client was allocated to SC. If the only clinical indicator was CI and /or behavior problems, the client was allocated to a specialized SC group, called SC for CI (SC+). For clients in the low or moderate level of disability with the presence of any other RUGs clinical indicator, they were allocated to NH care. In this province, NHs provide 24-hour professional nursing care, both supportive and medical. SC provides care that falls between NH and home care, such as maintenance cooking and cleaning with limited medical attention.

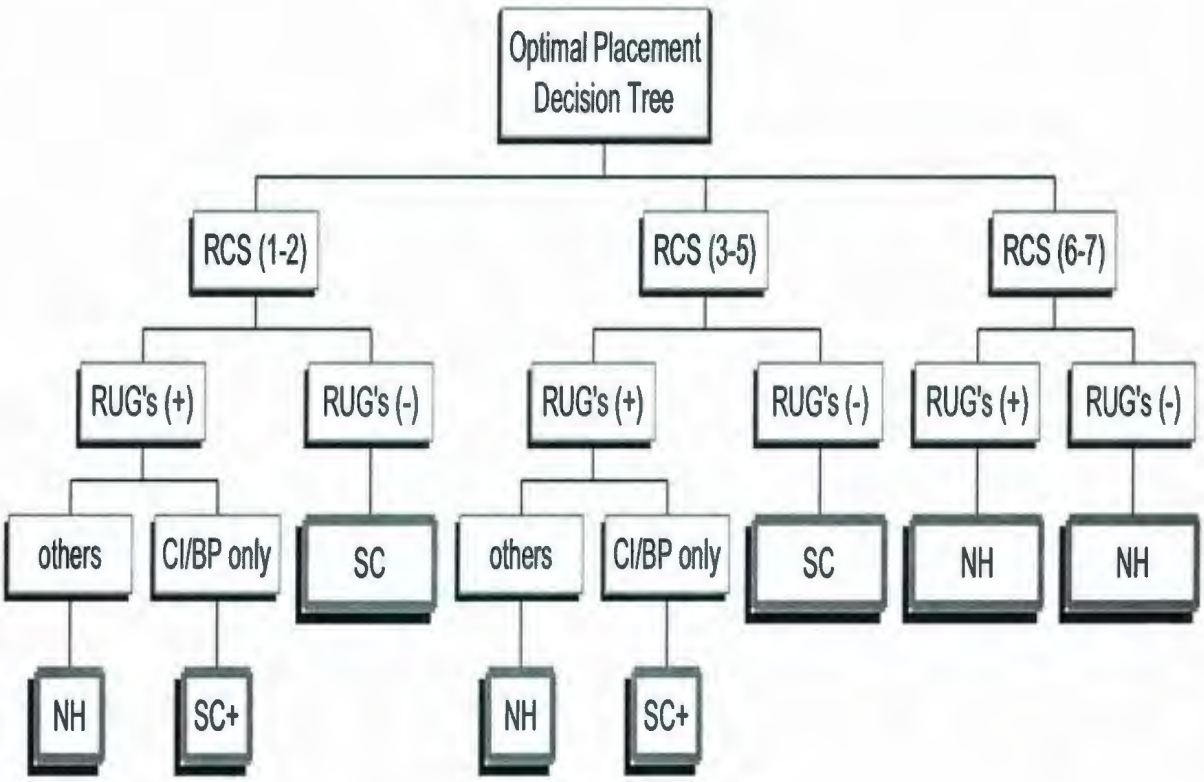


Figure 3.4. Researcher Decision Tree for Optimal Placement.

ARCS = Alberta Resident Classification System; RUGs = Resource Utilization Groups; CI/BP = Cognitive Impairment/Behavior Problems; SC = Supervised Care; SC+ = Supervised Care for cognitively impaired; NH = Nursing Home; Others = Clients with RUGs indicators, who do not have CI/BP as their only indicator.

3.10 Analysis

All analyses were performed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics were used to summarize the various groups. A database combining both 1995/96 and 1999/00 incident groups was constructed from two individual databases to perform analysis comparing the characteristics of the two groups. The chi square test was used for categorical variables. T-tests were used for continuous, normally distributed variables. A p-value of less than 0.05 was used to indicate statistical significance.

For both cohorts, the number of days between the panel date and placement date was computed. Kaplan Meier analysis was conducted to obtain the median time to placement, with censoring for death or last follow-up. A log rank statistic was used to compare each group between time periods.

The number of years to death or last follow up was computed from panel assessment dates. Kaplan Meier analysis was used to obtain the mortality curves for both SC and NH groups in both cohorts. The log rank statistic was used to compare each group between time periods as well as to compare between groups within a cohort.

Kaplan Meier analysis was also used to compute survival times from panel assessment dates, in the groups defined by optimal placement. A log rank statistic was used to compare survival between time periods for each group.

The effect of various characteristics on the efficiency of placement and on survival was analyzed using Cox's Regression. Both univariate and multivariate analysis were conducted using the variables RUGs, ARCS, residence at application, sex, age and panel placement into NH and SC to identify independent predictors of placement times and survival.

At the time this analysis was conducted, calculations were used to predict the demand for LTC beds for 2004 and 2014. First, the annual incidence rate of demand was calculated for SC, NH care, and SC+ using rates from the present population and extrapolated to the projected population. The bed need was calculated by multiplying the projected incidence for that population, at that point in time, by the survival for the group of interest.

3.11 Assumptions Used in Projecting Future Needs

Many assumptions were made to project the future needs of LTC in the St. John's Region. The accuracy of assumptions depends on the reliability of the data from which they are made. The longer the projection time the higher the likelihood the assumptions were inaccurate. In this study, demand for LTC was projected for 2004 and 2014. Since this project included two annual incidence cohorts, it was possible to compare relevant data used in making projections. The following assumptions were made:

1. Population Projections: These were derived from census data projections in 1995 and 2000. However demographic change may occur because of the depopulation of outport communities and movement into St. John's and the mainland. We assumed net out-migration from the Province will remain in the -1,500 to 1,000 per year over

the next several years. Beyond 2007, net out-migration will trend to zero and net in-migration will begin to occur late in the projection period. Migration will have little impact on the number of people 75 years and older in the province but may influence the number of family members available to provide voluntary care.

2. Mortality: This would be observed in the two cohorts studied. However, life expectancies will increase in line with recent trends in age specific mortality rates. Male life expectancy will increase by 1.9 years between 2003 and 2018; Female life expectancy will increase by 1.2 years over the same period. Whether this will impact on survival in LTC is unknown.
3. Consistent degrees of disability: We assumed rates of disability would be similar to that observed in the two cohorts. Survival in LTC is strongly influenced by gender, age and degree of disability, and changes in any of these characteristics will affect survival. Furthermore, production of new facilities may attract new clients, particularly those with modest disability who may favor SC facilities, which emphasize privacy and dignity.
4. We assumed the decision tree was accurate in determining optimal placement as it depended on objective data. However, subjective data (such as the presence of a dependent spouse) may influence the placement decision.

As options for LTC become available that emphasize independence, dignity, privacy, comfort, and cost effectiveness, it is possible that the incidence of the elderly seeking placement will increase.

Chapter 4

Results

In this chapter, the calculated annual rates of clients seeking LTC will be provided. Two prevalent NH cohorts were compared to assess the effectiveness of the single entry system in enhancing appropriateness of placement and these results will be presented. An evaluation and comparison of the 1995/96 and 1999/00 incident cohorts will also be described, including where clients were placed in LTC (SC vs. NH), their demographic characteristics, disability, placement times into LTC, and mortality. The predictors of time to placement and time to death will also be explored. Using the researcher decision tree, optimal placement of clients into LTC, the differences between this optimal placement and how these clients were actually placed in the system will be illustrated. The survival times of the optimally placed groups are also included. Calculations of the annual and future demands for LTC will be presented using both conventional methods of placement in addition to optimal methods of placement explored in this project.

4.1 Annual Incident Rates of Clients Seeking Placement into Long Term Care

In 1995/96, 467 clients sought institutional placement through the St. John's single-entry system as did 464 clients in 1999/00. The number ineligible for placement because they made a precautionary application, withdrew, or were from another region was 69 in 1995/96 and 30 in 1999/00. Data was unavailable for 41 clients in 1995/96 compared to 31 in 1999. Clients eligible for placement in our study in 1995/96 and 1999/00 were 357 and 403, respectively. In 1995/96, the region had an at-risk population

of 7700 ≥75 years. However, in 1996, the St. John's Community Health region extended. In the 1996 census, this region had a population of 8435≥ 75 years, compared to 7700 in the old region. Therefore, in 1999/00, the at-risk population ≥ 75 years had increased from 8,435 in 1995/96 to 9,074 in 1999/00, an increase of 8%.

The incidence rate of application among seniors was 42.3 per 1000 seniors ≥75 yrs in this region in 1995/96 and a rate of 44.4 in 1999/00. To correct for those clients with no available data, it was assumed the same proportion of these clients would be eligible for placement as the clients with data. The adjusted number of clients eligible for placement was 392 in 1995/96 and 431 in 1999/2000. The adjusted incidence rate of application would be 392/8435 (46.5/1000 ≥ 75 yrs) and 431/9074 (47.5/1000 ≥ 75 yrs) (Table 4.1). Thus over 4 years the at-risk population increased by 639 (8%), and the incidence rate for the elderly needing placement for LTC was unchanged (42.3 to 44.4/1000 ≥ 75 yrs or 46.5 to 47.5/1000 ≥ 75 yrs).

Table 4.1
Annual Incident Rates of Clients Seeking Long Term Care (LTC) in 1995/96 1999/00 Cohorts

	1995/96	1999/00
Clients seeking placement into LTC	467	464
Clients eligible for study	426	433
Clients eligible for placement in study	357	403
Clients eligible for placement into LTC[a]	392	431
Population ≥75 years	8435[b]	9074
Incident rate of clients seeking LTC[c]	46.5	47.5

[a] Adjusted for clients with which no data was available. This adjustment was calculated as follows: 357/426=0.84; 0.84 x 467=392 (1995/96) and 403/433=0.93; 0.93 x 464=431 (1999/00). [b]After 1996, the geographic size of the region was increased, increasing the at risk population ≥75 years by 9.5% from 7700 in the old region, to 8435. [c] Incident rate was calculated using the adjusted number of clients eligible for placement into LTC and the total population ≥ 75 years. It is the rate per 1000 people ≥ 75 years and was calculated as follows: [(392/8435) X 1000] = 46.5 (1995/96) and [(403/9074) X 1000] = 47.5.

4.2 Characteristics of the Incident Cohorts

There were no significant differences in the demographic characteristics (age, sex, area of residence, location at application and panel recommendation) between the two cohorts. These results are shown in Table 4.2. About two thirds of both study populations were female.

In both annual cohorts, a large majority of the clients originated from the St. John's region. There was a slight decrease in the number of people originating from the Eastern region in 1999/2000, from 13% down to 9%. The portion of clients coming from other areas remained the same.

The location of residence at application was also not significantly different between the two groups. Interestingly in 1999/00, it was noted that almost 5% more clients originated from an acute care facility.

The proportion of clients recommended for SC by the panel in 1995 and 1999 was 25% and 28%, respectively. NH care was recommended for 75% of clients in 1995 and 72% of clients in 1999.

The mean age of both groups was approximately 81 years old. Figure 4.1 illustrates that the majority of clients were ≥ 75 years. The number of clients less than 65 years decreased slightly from 1995/1996 to 1999/2000, but overall this group still remained a small portion of the total, 5.5%.

Table 4.3 compares the clinical indicators for NH care in the two populations. A large portion of both cohorts had no RUGs indicators (36%). Another large portion was

classified as having impaired cognition and behavior problems. These clients comprised approximately a quarter of the total population. Although not statistically significant, it is worth noting that 7% more clients were classified in this group in 1995. In addition, an increased proportion of clients were classified as clinically complex in 1999 (20% vs. 14%). A greater proportion of clients requiring the highest level of care (special care and clinically complex) were present in 1999/2000 compared to 1995/1996.

Both 1995/96 and 1999/00 populations were similar with respect to their degree of disability (ARCS) (Table 4.4). The clients were grouped low, intermediate or high level care and over 40% of both cohorts were classified as requiring a low level of care. Less than one quarter of the groups required a high level of care at both time periods.

Table 4.2

Comparison of Demographic Characteristics of Clients Eligible for Long Term Care (LTC) Placement during 1995/96 and 1999/00.

	1995/96		1999/00		
Factors	*n*	%	*n*	%	*p*
Female	224	63	268	67	.279
Area of residence					.261
St. John's	295	83	348	86	
Eastern	46	13	37	9	
Other	16	4.5	18	4.5	
Location at application					.212
Community	182	51	181	45	
Acute care hospital	120	34	158	39	
Chronic care	55	15	64	16	
Panel recommendation					.371
SC	89	25	112	28	
NH	268	75	291	72	
	M	*SD*	*M*	*SD*	
Age	80.7	9.6	80.9	9.8	.786

Note. Statistically significant if $p < 0.05$. The 1995/96 cohort includes n=357 clients. The 1999/00 cohort includes n=403. SC = Supervised Care; NH = Nursing Home.

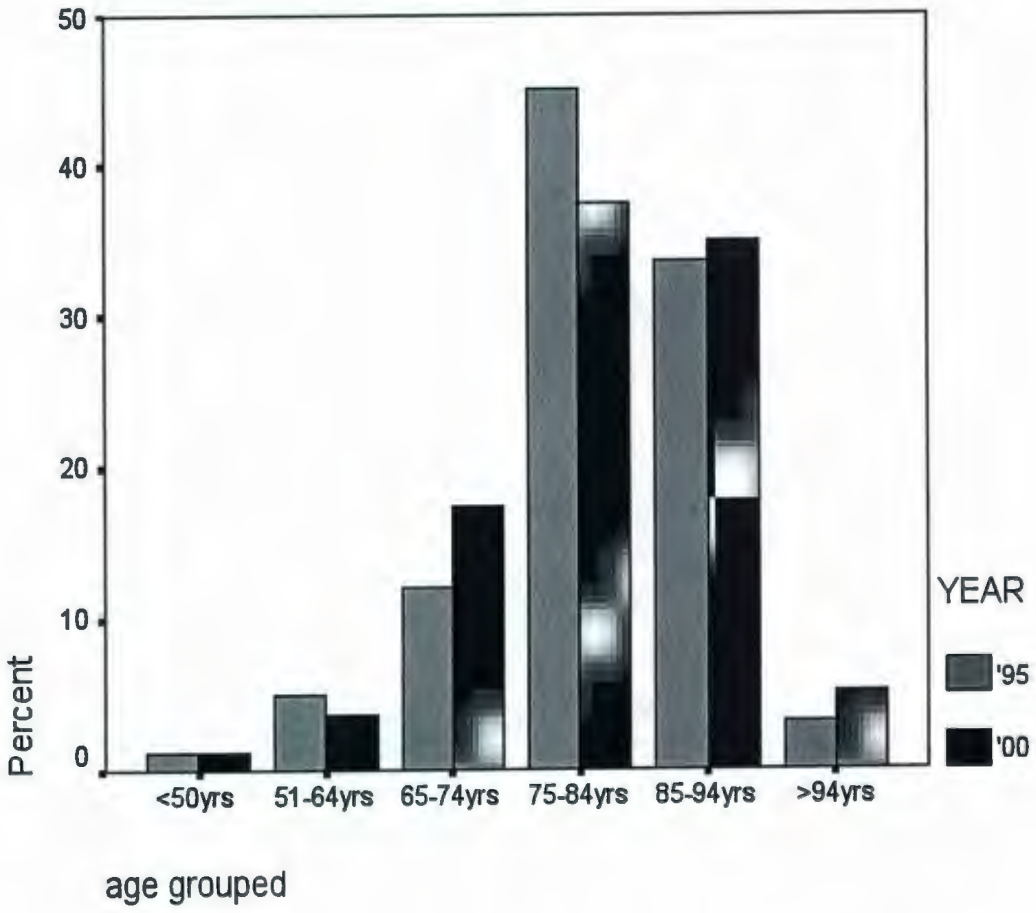


Figure 4.1. Comparison of Age Distribution among 1995/96 and 1999/00 Cohorts

Table 4.3

A Comparison of Resource Utilization Groups-III Clinical Indicators for Clients Eligible for Placement into Long Term Care (LTC) in 1995/96 and 1999/00 Cohorts.

	1995/96		1999/00		
	n	%	*n*	%	*p*
RUGs					.101
Special care	10	3	16	4	
Clinically complex	50	14	79	20	
Impaired cognition	100	28	86	21	
Reduced physical function	67	19	78	19	
No indicators	130	36	144	36	

Note: Statistically significant if $p < 0.05$. The 1995/96 cohort includes n=357 clients. The 1999/00 cohort includes n=403; RUGs = Resource Utilization Groups: a measurement tool of clinical indicators for nursing home care.

Table 4.4

A Comparison of Alberta Resident Classification System for Clients Eligible for Placement into Long Term Care (LTC) in 1995/96 and 1999/00 Cohorts.

	1995/96		1999/00		
	n	%	n	%	*p*
ARCS					.532
Low level	153	43	181	45	
Medium level	127	36	128	32	
High level	77	22	94	23	

Note: Statistically significant if $p < 0.05$. The 1995/96 cohort includes n=357 clients. The 1999/00 cohort includes n=403. ARCS=Alberta Resource Classification Score: a measurement tool of level of disability.

4.3 Characteristics of 1997 and 2003 Nursing Home Clients

A cross-sectional study of the client population within the NHs in the St. John's region was conducted in 1997 (n=1044) and 2003 (n=963). We assumed 1997 clients reflected admission policies before and just after the start of single entry in 1995, and 2003 clients reflected admission policies following the implementation of the single entry system. Table 4.5 shows that the two groups were significantly different for length of stay. The mean length of stay decreased from 4.5 years in the 1997 group to 3.7 years in 2003 group ($p = .023$). Median length of stay was 3.0 and 2.5 years, in 1997 and 2003, respectively. Also, there were no significant differences in demographic characteristics. Table 4.6 shows that RUGs was significantly different between 1997 and 2003 ($p=.000$). A much greater proportion of clients were considered clinically complex in 2003 (39%) compared to 1997 (25%), suggesting more appropriate utilization of resources since the single entry system was initiated. This is supported by the fall in the proportion with no RUGs clinical indicators for NH (19% in 1997 and 10% in 2003). Table 4.7 shows ARCS was significantly different between the two time periods ($p=.000$). A larger population of NH clients in 2003 (58%) had high care needs compared to 1997 (45%). In addition, it shows only 16% of clients in NHs were rated level one or level two in 2003 compared to 25% in 1997.

Table 4.5
A Comparison of Demographic Characteristics of the Prevalent Nursing Home (NH) Clients in 1997 and 2003

	1997		2003		
Factors	*M*	*SD*	*M*	*SD*	*p*
Age (years)	82	11.5	82	11.3	NS
Length of Stay (years)	4.5	4.8	3.7	4.8	**.023**
	Mdn		*Mdn*		
Length of Stay (years)	3		2.5		
	n	%	*n*	%	
Female	783	75	713	74	NS
Area of residence					NS
St. John's	810	77.6	804	83.4	
Eastern	166	15.9	101	10.5	
Other	68	6.5	58	6.0	
Location at application					NS
Community	518	49.6	445	46.2	
Acute care	208	19.9	150	15.6	
Chronic/PCH	318	30.5	360	37.4	
No information			8	.8	

Note. NS=not statistically significant at $p < 0.05$. The 1997 cohort includes n=1044 clients. The 2003 cohort includes n=963. Mdn=median; PCH = Personal Care Home.

Table 4.6
A Comparison of Clinical Indicators of the Prevalent Nursing Home (NH) Clients in 1997 and 2003

	1997		2003		
	n	%	*n*	%	P
RUGs					**.000**
Special care	53	5	54	6	
Clinically complex	259	25	372	39	
Impaired cognition	207	20	177	18	
Reduced physical function	332	32	265	28	
No indicators	193	19	95	10	

Note. Statistical significance if $p < 0.05$. The 1997 cohort includes n=1044 clients. The 2003 cohort includes n=963. RUGs = Resource Utilization Groups: a measurement tool assessing clinical indicators for nursing home care.

Table 4.7
A Comparison of Alberta Resident Classification System of the Prevalent Nursing Home (NH) Clients in 1997 and 2003

	1997		2003		
	n	%	n	%	*p*
ARCS					**.000**
Low level (A,B)	263	25	157	16	
Medium level (C,D)	307	30	249	26	
High level (E,G)	474	45	557	58	

Note. Statistical significance if $p < 0.05$. The 1997 cohort includes n=1044 clients. The 2003 cohort includes n=963. ARCS = Alberta Resource Classification Score: a measurement tool used to assess level of disability.

4.4 Efficiency of the System - Time to Placement

4.4.1 1995/96 vs. 1999/00 Cohorts.

Table 4.8 demonstrates no significant difference in median time to placement between the two time periods when the total clients in each cohort were compared (69 vs. 51 days, p=.727). In addition, there was no difference in the SC group (22 vs. 20 days, p=.212) or in the NH group (77 vs. 75 days; p=.725). However, time to NH was longer than SC at both time periods.

4.4.2 Supervised Care vs. Nursing Home in 1995/96 Cohort.

For all LTC clients in the 1995/96 cohort, the median time to placement was 69 days (Table 4.8). Overall, 58% were placed within the first 3 months, and 81% within 6 months as illustrated in Figure 4.2. Table 4.8 also shows that for clients being placed into SC, the median time to placement was 22 days, compared to 77 days for entry into a NH. Time to placement is shown in Figure 4.3.

4.4.3 Supervised Care vs. Nursing Home in 1999/00 Cohort.

For all LTC clients in the 1999/00 cohort, the median time to placement was 51 days (Table 4.8). Overall 58% were placed in 3 months and 80% within 6 months as illustrated in Figure 4.4. Table 4.8 also shows that for clients being placed into SC, the median time to placement was 20 days compared to 75 days for entry into a NH. Time to placement is shown in Figure 4.5.

Table 4.8
Median Time to Placement from Assessment Decision Comparing 1995/96 and 1999/00 Cohorts.

	1995/96			1999/00			
	n	*Mdn*	95% CI	*n*	*Mdn*	95% CI	*p*
Time to placement							
SC	89	22	[0,45]	112	20	[12,28]	.212[a]
NH	268	77	[65,89]	291	75	[51,99]	.725[b]
Total	357	69	[58,80]	403	51	[36,66]	.727[c]

Note. Statistical significance if $p < 0.05$. The 1995/96 cohort includes n= 357; the 1999/00 cohort includes n=403; SC = Supervised Care; NH = Nursing Home; Mdn = median time from assessment to placement in days.

[a]Log Rank (Mantel Cox) comparing SC between time periods: chi-square=1.56, df=1, sig =.212; [b]Log Rank (Mantel Cox) comparing NH between time periods: chi-square: .125, df=1, sig=.725; [c]Log Rank (Mantel Cox) comparing total cohort groups between time periods: chi-square=.122, df=1, sig=.727.

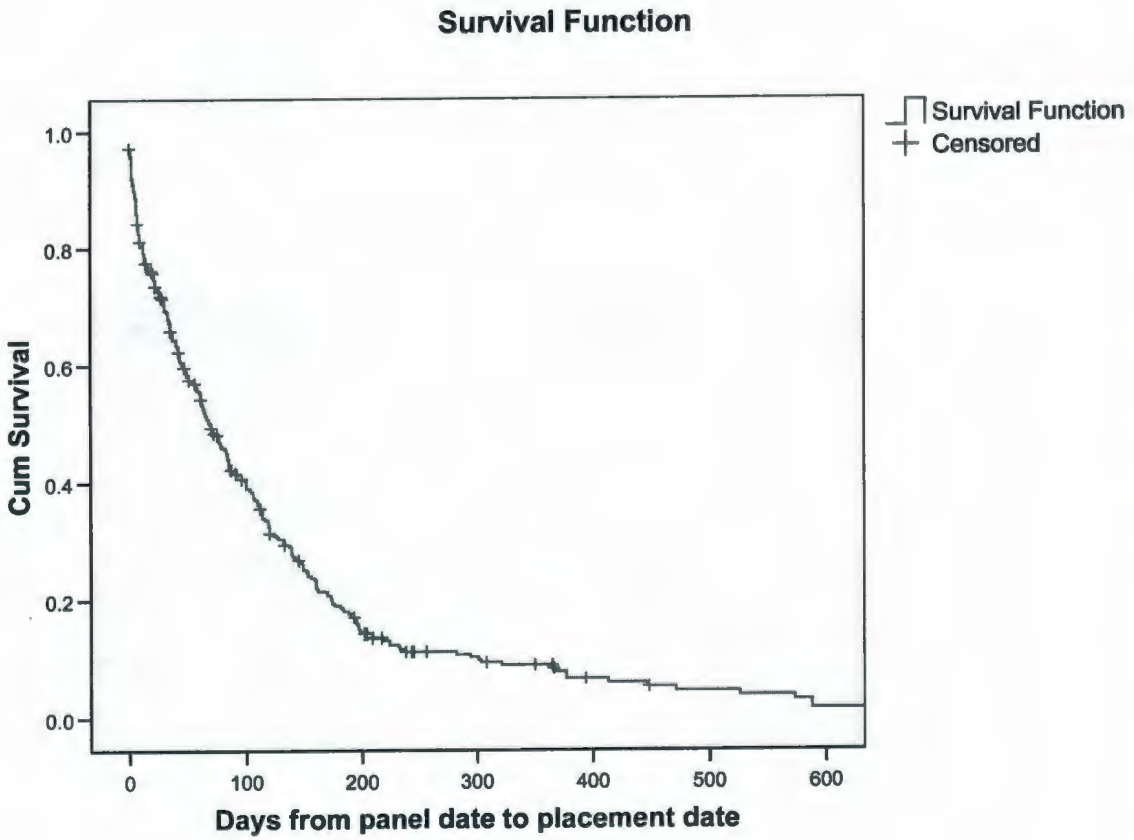


Figure 4.2. Time to Placement in the 1995/96 Cohort in Clients Recommended for Placement

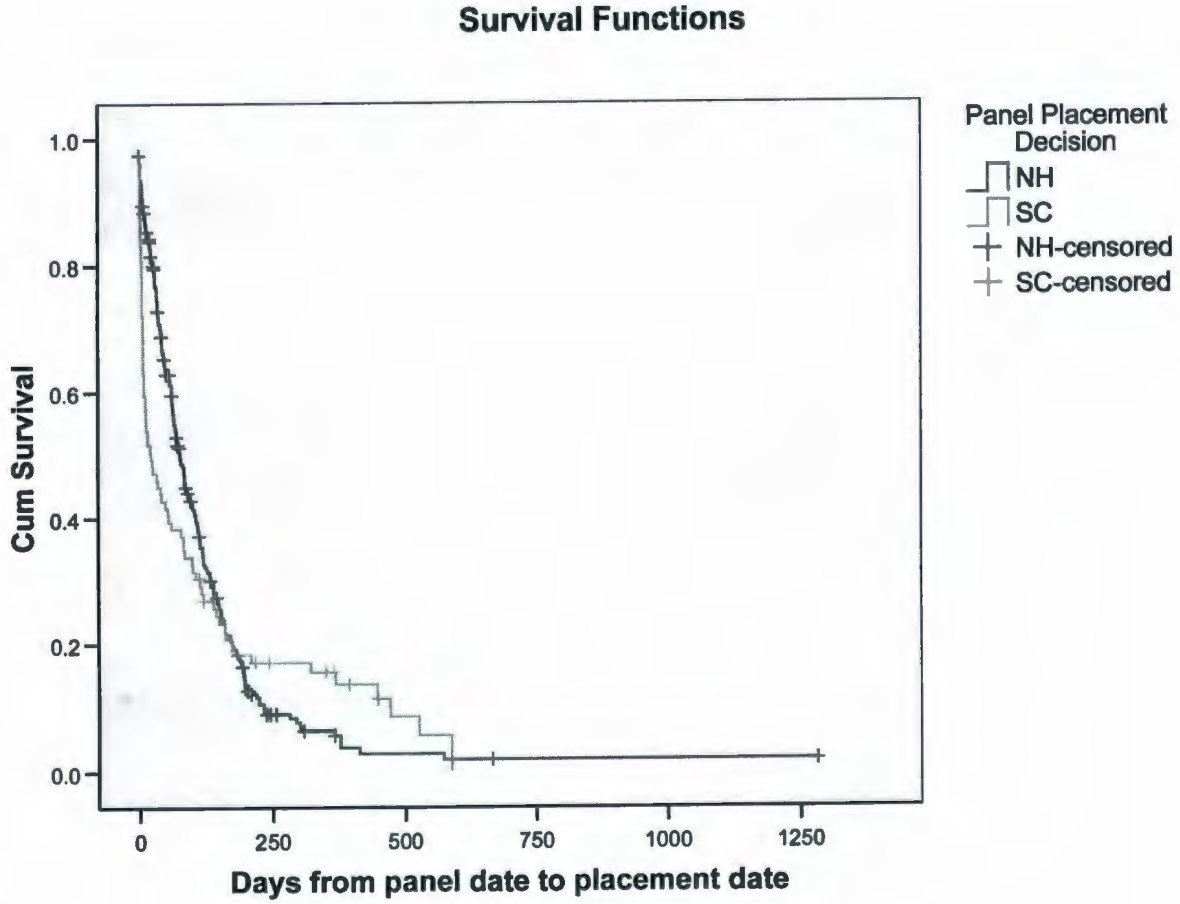


Figure 4.3. Time to Placement in Supervised Care (SC) and Nursing Home (NH) Groups, in 1995/96 Cohort in Clients Recommended for Placement.

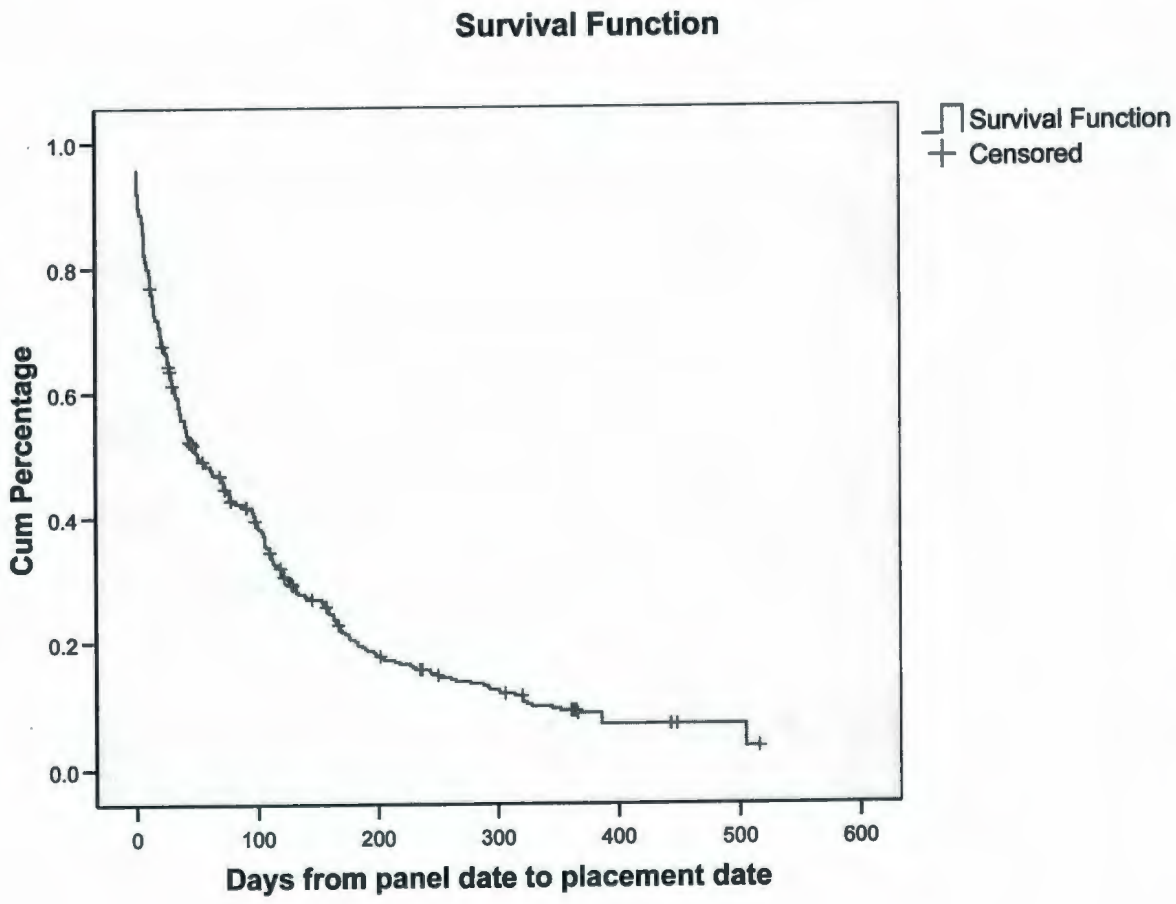


Figure 4.4. Time to Placement in the 1999/00 Cohort in Clients Recommended for Placement.

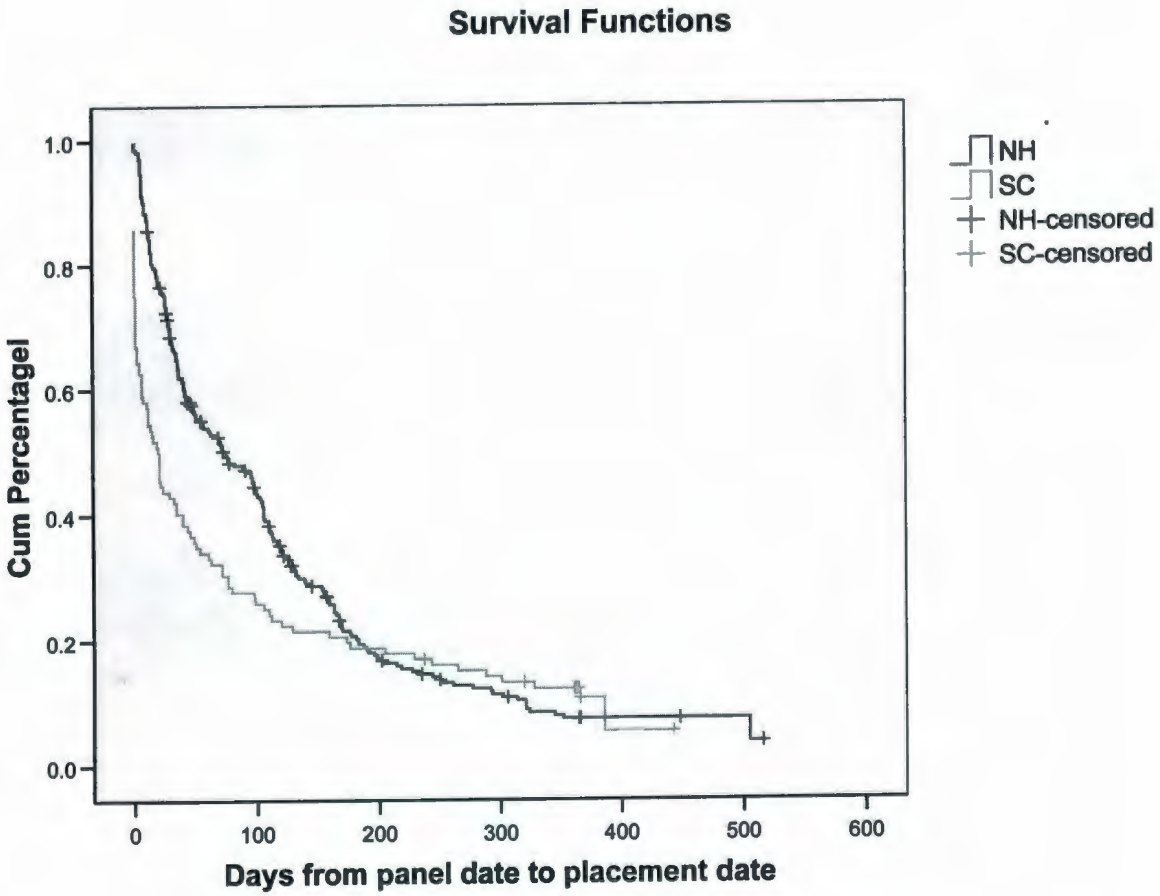


Figure 4.5. Time to Placement in Supervised Care (SC) and Nursing Home (NH) Groups in 1999/00 Cohort, in Clients Recommended for Placement.

4.5 Predicting Time to Placement

A number of characteristics were studied to assess their impact on time to placement. Analysis of all groups (SC, NH and combined) included assessment of the same characteristics. These included age, residence, ARCS, RUGs, sex, and incident cohort year. Panel placement into NH or SC was assessed in the combined group. Univariate and multivariate analysis were conducted on all three groups.

4.5.1 Univariate Analysis.

Univariate analysis conducted on the two cohorts combined is shown in Table 4.9. Residence from where the clients were applying was a significant predictor of time to placement. For instance, those coming from an acute care facility were 1.30 times more likely to be placed sooner than those from the community (95% CI [1.10,1.55], p=.003). Clients going to SC were 1.25 times more likely to be placed sooner than NH (95% CI [1.05,1.48], p=.014). Clients with impaired cognition were 1.27 times more likely to be placed sooner than clients with no indicators for NH care (95% CI [1.04,1.55], p=.020). Age was also significant. There was a 0.99 times greater likelihood of being placed sooner (95% CI [0.98,0.99], p=.014). This is per year above reference value, so with each decade above reference, this risk would be quite significant.

When SC and NH groups were analyzed separately, ARCS and residence were significant predictors in the SC group (Table 4.10). Intermediate level ARCS clients were 3.48 times more likely to be placed sooner then low level (95% CI [1.75,6.92], p=.000), however, the 95% CI was broad and the sample size was small. Coming from acute care

showed a 2.49 greater likelihood of being placed sooner than those from the community (95% CI [1.74,3.56], p=.000). Age reached a statistically significant p-value (p=.010) but the 95% CI approached one (95% CI [0.96,1.00]) so was not a significant predictor of time to placement.

In the NH group, RUGs and ARCS were significant predictors of time to placement (Table 4.11). Clients with CI and reduced physical function were both 1.58 times more likely to be placed sooner than those with no RUGs clinical indicators (95% CI [1.21-2.06], p=.001) and (95% CI [1.20,2.09], p=.001) respectively. The intermediate ARCS group was 1.35 times more likely to be placed sooner (95% CI [1.07,1.70], p=.009) and those with a high ARCS were 1.48 times more likely to be placed sooner (95% CI [1.16,1.90], p=.002) than clients with a low score.

Table 4.9
Univariate Cox Regression Analysis Showing Predictors of Time to Long Term Care (LTC) Placement in 1995/96 & 1999/00 Cohorts Combined (n=760)

Factors	*M*	*B*	*SE*	*Exp(B)*	*95% CI*	*p*
Residence						
Community*	152					
Acute care	86	.264	.088	1.30	[1.10,1.55]	**.003**
Chronic	122	-.001	.114	1.00	[0.80,1.25]	.990
ARCS						
Low level*	142					
Median level	106	.095	.090	1.10	[0.92,1.31]	.291
High level	95	.117	.104	1.12	[0.92,1.38]	.262
RUGs						
No indicators*	142					
Special Care	94	.128	.224	1.14	[0.73,1.76]	.567
Clinically complex	135	-.119	.120	0.89	[0.70,1.12]	.319
Impaired cognition	96	.236	.102	1.27	[1.04,1.55]	**.020**
Reduced physical function	93	.165	.112	1.18	[0.95,1.47]	.141
Sex						
Male*	152					
Female	109	.144	.083	1.16	[0.98,1.36]	.083
Panel						
NH*	134					
SC	107	.219	.089	1.25	[1.05,1.48]	**.014**
Year						
1995/96*	559					
1999/00	201	.027	.079	1.03	[0.88,1.20]	.729
Age	-	-.004	.005	0.99	[0.98,0.99]	**.014**

Note. Statistically significant if $p < 0.05$; Factors = all the variables in Cox regression Analysis; * = reference category; M = mean time to placement; B =regression coefficient; SE = standard error of B; 1995/96 cohort includes n =357; 1999/00 cohort includes n = 403.

Table 4.10
Univariate Cox Regression Analysis Showing Predictors of Time to Long Term Care (LTC) Placement in 1995/96 & 1999/00 Cohorts Combined, in the Supervised Care (SC) group only (n=201)

Factors	*M*	B	*SE*	*Exp(B)*	*95% CI*	*p*
Residence						
Community*	138					
Acute care	22	.911	.183	2.49	[1.74,3.56]	**.000**
Chronic	75	.298	.294	1.35	[0.76,2.39]	.311
ARCS						
Low level*	112					
Medium level	6	1.25	.351	3.48	[1.75,6.92]	**.000**
RUGs						
No indicators*	115					
Clinically complex	85	.102	.301	1.11	[0.61,1.99]	.734
Impaired cognition	35	.481	.259	1.62	[0.97,2.69]	.063
Sex						
Male*	125					
Female	98	.096	.155	1.10	[0.81,1.49]	.535
Year						
1995/96*	119					
1999/00	91	.188	.153	1.21	[0.89,1.63]	.221
Age	-	-.020	.008	.980	[0.96,1.00]	.010

Note. Statistically significant if $p < 0.05$; Factors = all the variables in Cox regression Analysis; * = reference category; M = mean time to placement; B =regression coefficient; SE = standard error of B; 1995/96 cohort includes n =357; 1999/00 cohort includes n = 403.

Table 4.11

Univariate Cox Regression Analysis Showing Predictors of Time to Long Term Care (LTC) Placement in 1995/96 & 1999/00 Cohorts Combined, in the Nursing Home (NH) group only (n=559)

Factors	*M*	B	*SE*	*Exp(B)*	*95% CI*	*p*
Residence						
Community*	167					
Acute care	99	.147	.104	1.16	[0.94,1.42]	.159
Chronic	128	-.072	.129	0.93	[0.72,1.20]	.574
ARCS						
Low level*	200					
Medium level	110	.301	.116	1.35	[1.07,1.70]	**.009**
High level	95	.393	.127	1.48	[1.16,1.90]	**.002**
RUGs						
No indicators*	189					
Special care	94	.428	.240	1.54	[0.96,2.46]	.074
Clinically complex	135	.094	.152	1.10	[0.82,1.48]	.535
Impaired cognition	103	.455	.135	1.58	[1.21,2.06]	**.001**
Reduced physical function	93	.461	.141	1.58	[1.20,2.09]	**.001**
Sex						
Male*	154					
Female	113	.171	.099	1.19	[0.98,1.44]	.083
Year						
1995/96*	126					
1999/00	121	-.032	.093	0.97	[0.81,1.16]	.726
Age	-	-.004	.005	.996	[0.99,1.01]	.451

Note. Statistically significant if $p < 0.05$; Factors = all the variables in Cox regression Analysis; * = reference category; M = mean time to placement; B =regression coefficient; SE = standard error of B; 1995/96 cohort includes n =357; 1999/00 cohort includes n = 403.

4.5.2 Multivariate Analysis

To determine whether these factors were independent predictors of time to placement, multivariate analysis was performed. The incident cohorts were combined for this analysis. Panel placement, sex, RUGs, ARCS, residence and age were significant. The results are shown in Table 4.12.

Being recommended by the panel to SC was associated with a two times greater likelihood of being placed sooner when compared to NH (95% CI [1.54,2.59], p=.000). Sex was also significant. Females were 1.31 times more likely to be placed sooner than males (95% CI [1.10,1.56], p=.002). The cognitively impaired were 1.57 times more likely to be placed sooner than clients with no clinical indicators for NH placement (95%CI [1.23,1.99], p=.000). The residence from which the client originated was a significant, independent risk factor. Clients from acute care were 1.47 times more likely to be placed sooner then clients from the community (95% CI [1.20,1.80], p=.000). Age was also significant with a 0.99 times likelihood of being placed sooner for every year above reference value (95% CI [0.98,0.99], p=.011). Medium level ARCS was not statistically significant as the 95% CI reached one, although the p-value was 0.046. Therefore, it was not a significant predictor of time to placement.

When the SC and NH groups were analyzed separately, ARCS score and residence were significant in the SC group as shown in Table 4.13. Having intermediate ARCS was associated with a 3.57 times greater likelihood of being placed sooner compared to a low score (95% CI [1.70,7.52], p=.001). The confidence interval was wide

and the group had a small sample size. Clients coming from acute care were 2.20 times more likely to be placed sooner than those from the community (95% CI [1.50,3.25], p=.000).

Multivariate analysis on the NH group showed that RUGs, ARCS and sex were significant predictors of time to placement. The cognitively impaired were 1.50 times more likely to be placed faster compared to clients without indicators for NH care (95% CI [1.14,1.98], p=.004). Females were 1.31 times more likely to be placed faster compared to males (95% CI [1.07,1.62], p=.010). High level ARCS was also significant with a 1.43 times more likelihood to be placed sooner compared to low level (95%CI [1.03,1.99], p= .034). Intermediate ARCS reached a p-value 0.047, however, the 95% CI included one and therefore was determined not to be a significant predictor of time to placement.

Table 4.12
Multivariate Cox Regression Analysis Showing Predictors of Time to Long Term Care (LTC) Placement in the 1995/96 & 1999/00 Cohorts Combined (n=760)

Factors	*M*	B	*SE*	*Exp(B)*	*95% CI*	*p*
Residence						
Community*	152					
Acute care	86	.387	.103	1.47	[1.20,1.80]	**.000**
Chronic	122	.096	.123	1.10	[0.87,1.40]	.436
ARCS						
Low level*	142					
Medium level	106	.245	.123	1.28	[1.00,1.63]	.046
High level	95	.278	.164	1.32	[0.96,1.82]	.089
RUGs						
No indicators*	142					
Special Care	94	.040	.265	1.04	[0.62,1.75]	.880
Clinically complex	135	.097	.149	0.91	[0.68,1.22]	.516
Impaired cognition	96	.448	.123	1.57	[1.23,1.99]	**.000**
Reduced physical function	93	.238	.160	1.27	[0.93,1.74]	.137
Sex						
Male*	152					
Female	109	.271	.088	1.31	[1.10,1.56]	**.002**
Panel						
NH*	134					
SC	107	.691	.133	2.00	[1.54,2.59]	**.000**
Year						
1995/96*	559					
1999/00	201	.039	.080	1.04	[0.89,1.22]	.630
Age	-			0.99	[0.98,0.99]	**.011**

Note. Statistically significant if $p < 0.05$; Factors = all the variables in Cox regression Analysis; * = reference category; M = mean time to placement; B =regression coefficient; SE = standard error of B; 1995/96 cohort includes n =357; 1999/00 cohort includes n = 403.

Table 4.13
Multivariate Cox Regression Analysis Showing Predictors of Time to Long Term Care (LTC) Placement in the 1995/96 & 1999/00 Cohorts Combined, in the Supervised Care (SC) group only (n=201)

Factors	*M*	B	*SE*	*Exp(B)*	*95% CI*	*p*
Residence						
Community	138					
Acute care	22	.789	.198	2.20	[1.50,3.25]	**.000**
Chronic	75	.018	.310	1.02	[0.55,1.87]	.953
ARCS						
Low level	112					
Medium level	6	1.27	.379	3.57	[1.70,7.52]	**.001**
RUGs						
No indicators	115					
Clinically complex	85	-.294	.320	0.75	[0.40,1.40]	.359
Impaired cognition	35	.125	.277	1.13	[0.66,1.95]	.652
Sex						
Male	125					
Female	98	.123	.161	1.13	[0.83,1.55]	.443
Year						
1995/96	119					
1999/00	91	.233	.163	1.26	[0.92,1.74]	.152
Age	-	-.017	.009	0.98	[0.97,1.00]	.053

Note. Statistically significant if $p < 0.05$; Factors = all the variables in Cox regression Analysis; * = reference category; M = mean time to placement; B =regression coefficient; SE = standard error of B; 1995/96 cohort includes n =357; 1999/00 cohort includes n = 403.

Table 4.14
Multivariate Cox Regression Analysis Showing Predictors of Time to Long Term Care (LTC) Placement in the 1995/96 & 1999/00 Cohorts Combined, in the Nursing Home (NH) group only (n=559)

Factors	*M*	B	*SE*	*Exp(B)*	*95% CI*	*p*
Residence						
Community*	167					
Acute care	99	.159	.119	1.17	[0.93,1.48]	.184
Chronic	128	-.080	.137	.923	[0.71,1.21]	.556
ARCS						
Low level*	200					
Medium level	110	.249	.125	1.28	[1.00,1.64]	.047
High level	95	.359	.169	1.43	[1.03,1.99]	**.034**
RUGs						
No indicators*	189					
Special care	94	.135	.274	1.14	[0.67,1.96]	.623
Clinically complex	135	-.057	.169	0.94	[0.68,1.32]	.734
Impaired cognition	103	.406	.141	1.50	[1.14,1.98]	**.004**
Reduced physical function	93	.266	.171	1.30	[0.93,1.82]	.121
Sex						
Male*	154					
Female	113	.272	.106	1.31	[1.07,1.62]	**.010**
Year						
1995/96*	126					
1999/00	121	-.020	.095	0.98	[0.81,1.18]	.836
Age	-	-.006	.005	0.99	[0.98,1.01]	.288

Note. Statistically significant if $p < 0.05$; Factors = all the variables in Cox regression Analysis; * = reference category; M = mean time to placement; B =regression coefficient; SE = standard error of B; 1995/96 cohort includes n =357; 1999/00 cohort includes n = 403.

4.6 Survival - Time to Death in 1995/96 & 1999/00 Cohorts

A comparison of the mean and median survival times from the assessment date for clients recommended to placement in SC and NH is presented in Table 4.15. There were no significant differences in the survival times between the two time periods in the SC group (log rank p = .775) or the NH group (log rank p = .965).

However, the survival times were significantly different between the SC and NH groups within 1995/96 and 1999/00 (p=.002 and p=.000, respectively). They were longer for clients in the SC group compared to the NH groups. Figures 4.6 and 4.7 illustrate the differences in survival times between the SC and NH groups in 1995/96 and 1999/00, respectively.

Table 4.15

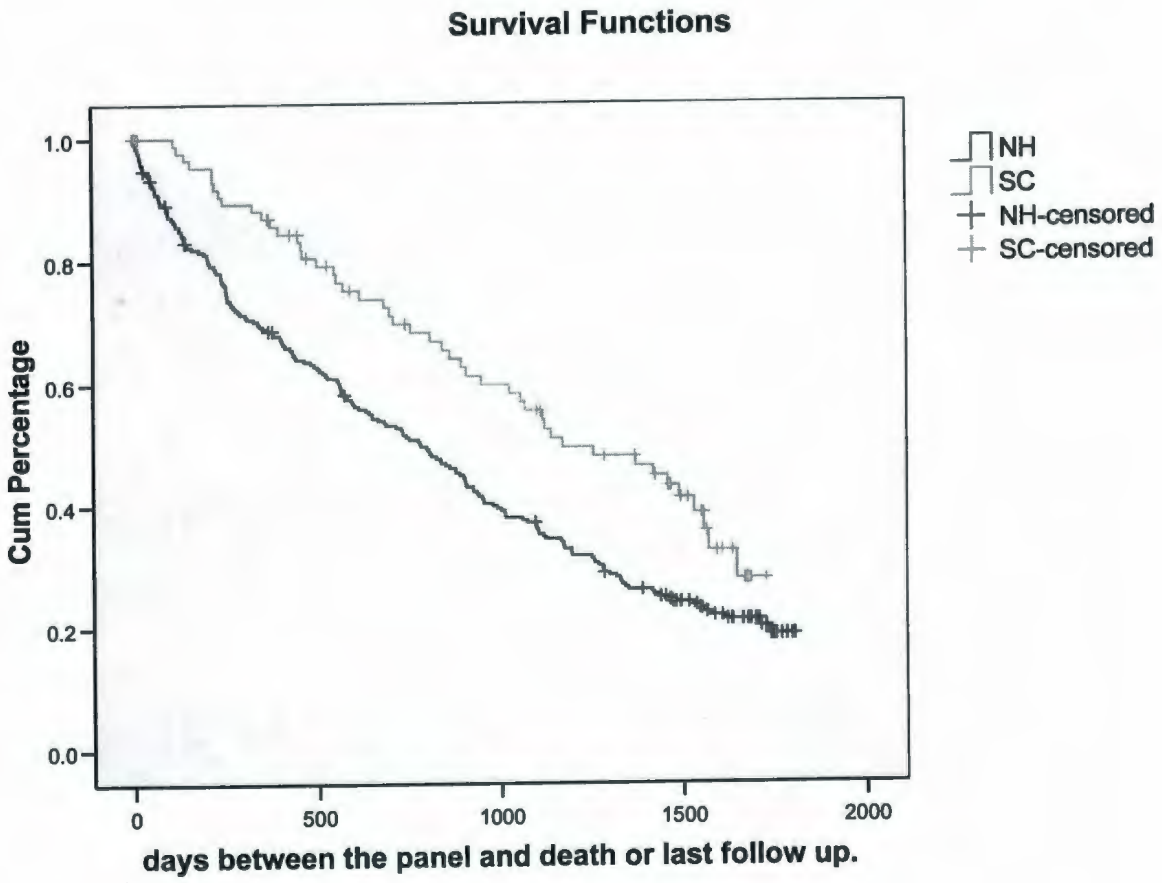
Mean and Median Survival From Panel Assessment Date in Supervised Care (SC) and Nursing Home (NH) Groups Comparing 1995/96 and 1999/00 Cohorts

	Survival (years)						
	1995/1996			1999/2000			
	n	*M* [95%CI]	*Mdn* [95%CI]	n	*M* [95%CI]	*Mdn*[95%CI]	*p*
SC	89	3.09[2.7,3.4]	3.21[2.2,4.2]	112	3.02[2.6,3.5]	3.61[2.6,4.5]	.775[a]
NH	268	2.35[2.1,2.6]	2.41[1.7,2.5]	291	2.23[2.0,2.4]	2.06[1.8,2.4]	.965[b]

Note. SC = supervised care. *NH* = nursing home. *M* = mean. *Mdn* = median; statistically significant at $p < 0.05$.

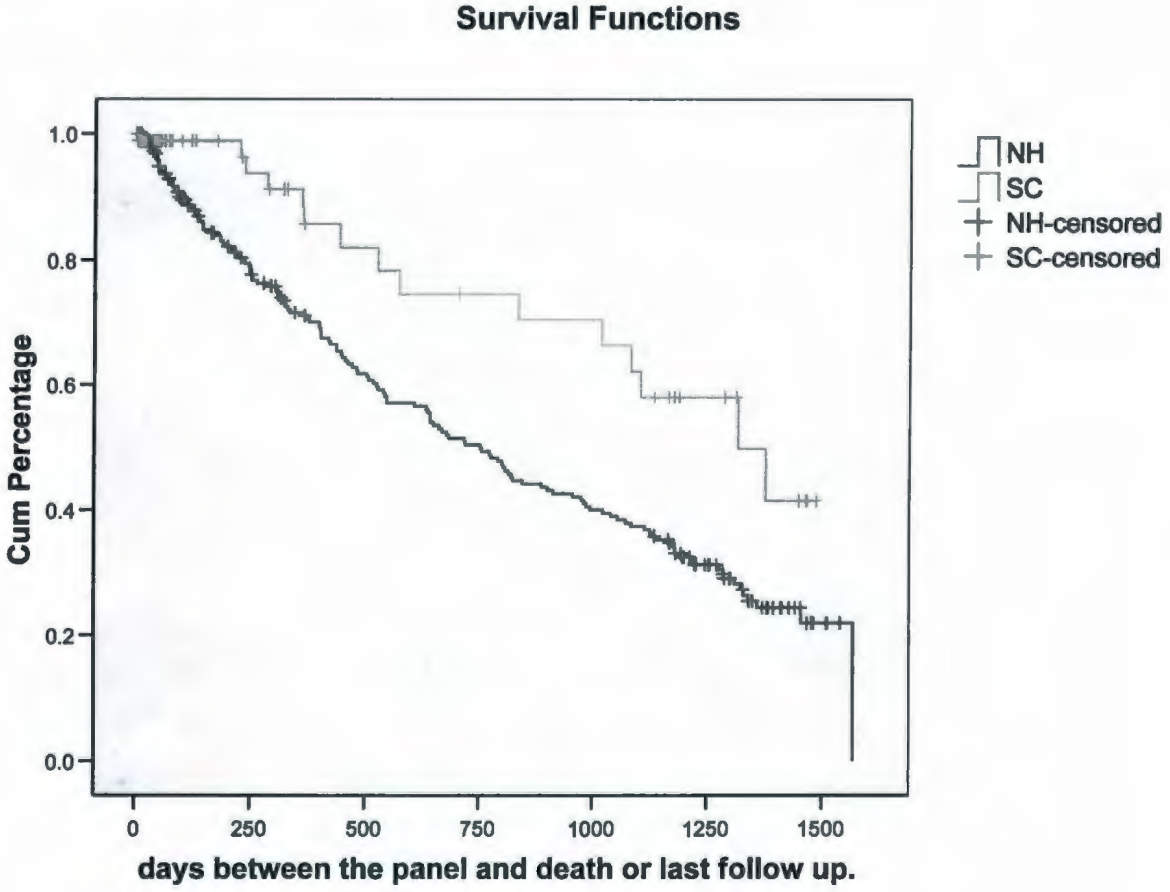
[a]Log rank (Mantel Cox) statistic comparing SC between time periods: .082, df 1, p = .775

[b]Log rank (Mantel Cox) statistic comparing NH between time periods: .002, df 1, p = .965



*Log Rank (Mantel-Cox): chi-square=9.452; df=1; p=**.002**

Figure 4.6. Survival Curve Comparing Clients Recommended to Supervised Care (SC) and Nursing Home (NH) Care in the 1995/96 Cohort



*Log Rank (Mantel-Cox): chi-square=17.359; df=1; p=**.000**

Figure 4.7. Survival Curve Comparing Clients Referred to Supervised Care (SC) and Nursing Home (NH) Care in the 1999/00 Cohort.

4.7 Predicting Time to Death

A number of characteristics were studied to assess their impact on time to death. The 1995/96 and 1999/00 cohorts were combined for the univariate and multivariate analysis. Factors analyzed included age, residence, ARCS, RUGs, sex, incident cohort year and placement into NH or SC.

4.7.1 Univariate Analysis.

For the combined cohort, several factors were significant predictors of mortality in clients recommended for LTC placement and these are shown in Table 4.16. Clients recommended to NH were 1.76 times more likely to die sooner than clients recommended to SC (95% CI [1.34,2.31], p=.000) and males were 1.53 times more likely to die sooner than females (95% CI [1.26,1.87], p=.000). ARCS and RUGs clinical indicators for NH care were significant predictors. Clients with special care needs were 2.27 times more likely to die sooner than clients with no indicators (95% CI [1.37,3.75], p=.001). Clinically complex clients were 2.08 times more likely (95% CI [1.56,2.79], p=.000), and clients with reduced physical function were 2.28 times more likely to die sooner (95% CI [1.74,2.99], p=.000) than those with no clinical indicators for NH care. Cognitively impaired clients showed a 1.49 times greater likelihood of dying sooner than those without CI (95% CI [1.14,1.95], p=.004). Clients with high and medium ARCS were 1.95 (CI [1.53,2.49], p=.000) and 1.44 (95% CI [1.15,1.81], p=.002) times, respectively, more likely to die sooner than clients with low ARCS. In addition, clients from an acute care facility were 1.33 times more likely to die faster then clients who came from the

community (95% CI [1.11,1.64], p=.008). Age showed a borderline p-value of .046, and the confidence interval included one. It therefore was determined not to be a significant predictor of time to death.

Table 4.16
Univariate Cox Regression Analysis Showing Predictors of Time to Death in the 1995/96 & 1999/00 Cohorts Combined (n=760)

Factors	*M*	B	*SE*	*Exp(B)*	*95% CI*	*p*
Residence						
Community*	2.7					
Acute care	2.3	.284	.106	1.33	[1.11,1.64]	**.008**
Chronic	2.5	.139	.144	1.15	[0.87,1.53]	.335
ARCS						
Low level*	3.0					
Medium level	2.4	.365	.116	1.44	[1.15,1.81]	**.002**
High level	2.0	.667	.125	1.95	[1.53,2.49]	**.000**
RUGs						
No indicators*	3.2					
Special Care	2.0	.816	.256	2.27	[1.37,3.75]	**.001**
Clinically complex	2.1	.734	.148	2.08	[1.56,2.79]	**.000**
Impaired cognition	2.6	.399	.137	1.49	[1.14,1.95]	**.004**
Reduced physical function	2.0	.826	.139	2.28	[1.74,2.99]	**.000**
Sex						
Female*	2.7					
Male	2.1	.428	.101	1.53	[1.26,1.87]	**.000**
Panel						
SC*	2.4					
NH	3.1	.566	.138	1.76	[1.34,2.31]	**.000**
Year						
1995/96*	2.5					
1999/00	2.4	.047	.101	1.05	[0.86,1.28]	.641
Age	-	.011	.005	1.01	[1.00,1.02]	.046

Note. Statistically significant if $p < 0.05$; Factors = all the variables in Cox regression Analysis; * = reference category; M = mean time to death in years; B =regression coefficient; SE = standard error of B; 1995/96 cohort includes n =357; 1999/00 cohort includes n = 403.

4.7.2 Multivariate Analysis.

For the combined cohort, several factors were found to be independent predictors of time to death for clients who were recommended for LTC placement as is shown in Table 4.17. Males were 1.59 times more likely to die sooner than females (95% CI [1.30,1.95], p=.000). Clients with clinical indicators for NH care showed an increased likelihood of death at a given time compared to clients without nursing care indicators. Clients classified as needing special care were 2.16 times more likely (95%CI [1.21,3.86], p=.010); clients who were clinically complex were 1.95 times more likely (95% CI [1.36,2.81], p=.000); clients with cognitive impairment were 1.44 times more likely (95% CI [1.07,1.95], p=.017); and clients with reduced physical function were 1.97 times more likely to die sooner when compared to clients without clinical indicators (95% CI [1.36,2.84], p=.000). Age was also a significant predictor. For every year older, there was a 1.02 times greater likelihood to die (95% CI [1.01,1.03], p=.000).

Table 4.17
Multivariate Cox Regression Analysis Showing Predictors of Time to Death in 1995/96 & 1999/00 Cohorts Combined (n=760)

Factors	*M*	B	*SE*	*Exp(B)*	*95% CI*	*p*
Residence						
Community*	2.7					
Acute care	2.3	.087	.121	1.09	[0.86,1.38]	.475
Chronic	2.5	-.155	.153	0.86	[0.63,1.16]	.312
ARCS						
Low level*	3.0					
Medium level	2.4	.032	.143	1.03	[0.78,1.37]	.825
High level	2.0	.032	.186	1.03	[0.72,1.49]	.865
RUGs						
No indicators*	3.2					
Special Care	2.0	.769	.297	2.16	[1.21,3.86]	**.010**
Clinically complex	2.1	.670	.185	1.95	[1.36,2.81]	**.000**
Impaired cognition	2.6	.366	.154	1.44	[1.07,1.95]	**.017**
Reduced physical function	2.0	.675	.189	1.97	[1.36,2.84]	**.000**
Sex						
Female*	2.7					
Male	2.1	.462	.104	1.59	[1.30,1.95]	**.000**
Panel						
SC*	2.4					
NH	3.1	.216	.173	1.24	[0.89,1.74]	.211
Year						
1995/96*	2.5					
1999/00	2.4	-.045	.103	0.96	[0.78,1.17]	.662
Age		.020	.006	1.02	[1.01,1.03]	**.000**

Note. Statistically significant if $p < 0.05$; Factors = all the variables in Cox regression Analysis; * = reference category; M = mean time to death in years; B =regression coefficient; SE = standard error of B; 1995/96 cohort includes n =357; 1999/00 cohort includes n = 403.

4.8 Optimal Placement to Long Term Care

To determine optimal placement of applicants to LTC, a decision tree was created using three data sources: ARCS, RUGs-III, and the presence of CI. Each client was classified according to ARCS with 1-2 (A,B) being low level care, 3-5 (C-E) being medium/intermediate level care and 6-7 (F,G) being high level care. Each client was then sub-classified according to the presence or absence of a RUGs-III category. Clients were also classified according to the presence or absence of CI. As a result, optimal placement was defined as SC if low-medium level of care and no RUGs-III disability; SC + if low-medium level of care and presence of CI; and NH if high level care or positive for RUG-III disability. Clients whose only disability according to RUGs-III was CI were allocated to SC +. This decision chart was illustrated in Design and Methods, Figure 3.4.

4.8.1 1995/96 Cohort.

Based on the optimal decision tree, clients were classified as requiring SC, SC +, or NH. Table 4.18 shows the number and percentage of clients placed in each of these three groups using optimal placement criteria. In total, optimal placement was 36% to SC, 26% to SC for CI, and 37% to NH. This contrasts with the actual placement (presented in Table 4.2 as panel recommendation), which was 25% to SC and 75% to NH.

4.8.2 1999/00 Cohort.

Based on the optimal decision tree, clients were classified as requiring SC, SC +, or NH. Table 4.19 shows the number and percentage of clients placed in each of these

1995/96 for SC (36%), a little lower for SC + (20%), and higher for NH (44%). Actual placement (presented in Table 4.2) was 28% to SC and 72% to NH.

Table 4.18
Optimal Placement of 1995/96 Cohort (n=357) into Supervised Care (SC), Supervised Care for Cognitively Impaired (SC+) and Nursing Home (NH) Using Optimal Decision Tree Criteria

		Level of disability				
		ARCS 1-2	ARCS 3-4	ARCS 6-7	Total	
Placement	RUGs[a]	*n*	*n*	*n*	*n*	%
	RUGs (+)					
SC+	CI only	41	53	-	94	26
NH	Others	7	49	77	133	37
SC	RUGs (-)	105	25	-	130	36

Note. SC+ = Supervised Care for the cognitively impaired; NH=Nursing Home; SC=Supervised Care; ARCS = Alberta Resident Classification System; RUGs=Resource Utilization Groups. n= number of residents in group.

[a]This RUGs category is broken down into clients with clinical indicators for nursing care and those that do not, defined by *RUGs (+)* and *RUGs(-)*, respectively. Within RUGs (+) groups, clients who have cognitive impairment (CI) as the only indicator is classified *CI only*. *Others* is defined as all other clients who have RUGs clinical indicators, excluding those with CI as their only clinical indicator for nursing care.

Table 4.19

Optimal Placement of 1999/00 Cohort (n=403) into Supervised Care (SC), Supervised Care for Cognitively Impaired (SC+) and Nursing Home (NH) Using Optimal Decision Tree Criteria

		Level of disability				
		ARCS 1-2	ARCS 3-4	ARCS 6-7	Total	
Placement	RUGs[a]	*n*	*n*	*n*	*n*	%
	RUGs (+)					
SC+	CI only	32	49	-	81	20
NH	Others	26	58	94	178	44
SC	RUGs (-)	123	21	-	144	36

Note. SC+ = supervised care for the cognitively impaired; NH=nursing home; SC= supervised care; ARCS = Alberta Resident Classification Score; RUGs=Resource Utilization Groups. *n*= number of residents in group.

[a]This RUGs category is broken down into clients with clinical indicators for nursing care and those that do not, defined by *RUGs (+)* and *RUGs(-)*, respectively. Within RUGs (+) groups, clients who have cognitive impairment (CI) as the only indicator is classified *CI only*. *Others* is defined as all other clients who have RUGs clinical indicators, excluding those with CI as their only clinical indicator for nursing care.

4.9 Optimal Placement Compared to Panel Placement

The proportion of clients who were recommended by the panel and subsequently placed into NH and SC, was compared to the proportion of clients who were assigned to the optimal groups. This was not a statistical comparison of percent agreement. A Kappa statistic was not a suitable test since it would require comparison of identical groups. Instead, the information is displayed in a table for visual comparison.

4.9.1 1995/96 Cohort.

Table 4.20 shows that almost 100% of the clients whose optimal placement was into NH were actually placed into NH at panel assessment. However, 40% of clients whose optimal placement was SC were actually placed into NH. The large majority (88%) of clients whose optimal placement was specialized care (SC+) were also placed into NH. The later was not surprising as no specialized facilities for CI were available. There appeared to be quite a discrepancy in the placement of clients between the two methods of placement, namely that a large portion of clients were put in NH care when they did not require that level or type of service.

4.9.2 1999/00 Cohort.

Table 4.21 shows that most of the clients whose optimal placement was into NH, were actually placed in NHs. However, only 65% of clients whose optimal placement was to SC were actually assigned to this group, resulting in a great number of clients inappropriately placed into NH. 93% of clients whose optimal placement was SC+ were actually placed into NH care at assessment. Like the 1995/96 cohort, there appeared to

be quite a discrepancy in placement of clients between the two methods of placement. Clients were put into NH beds when they didn't appear to need this type or level of care.

Table 4.20
Client Placement Using Optimal Methods vs. Current Methods in the 1995/96 Cohort

Panel Placement[a]	Optimal Placement[b]			Total
	SC	SC+	NH	
SC	76	11	2	89
NH	54	83	131	268
Total	130	94	133	357

Note. This was not a statistical comparison, as a Kappa statistical test of agreement was unable to be conducted due to the unequal number of variables in each group. This is an illustration comparing the numbers of clients in the two groups. The 1995/96 cohort includes n=357.

[a]Panel placement: placement of clients into SC or NH by the panel at assessment;

[b]Optimal placement: placement of clients according to researcher decision tree.

Table 4.21
Clients Placement using Optimal Methods and Current Methods in the 1990/00 Cohort

	Optimal Placement[b]			
Panel Placement[a]	SC	SC+	NH	Total
SC	94	6	12	112
NH	50	75	166	291
Total	144	81	178	403

Note. This is not a statistical comparison as a Kappa statistical test of agreement was unable to be conducted due to the unequal number of variables in each placement group. This is an illustration comparing the numbers of clients in the two groups. The 1999/00 cohort includes n=403. SC=supervised care, SC+=supervised care for the cognitively impaired, NH=nursing home.

[a]Panel placement: placement of clients into SC or NH by the panel at assessment;

[b]Optimal placement: placement of clients according to researcher decision tree.

4.10 Survival in Groups Defined By Optimal Placement

There were no significant differences in the mean survivals of residents defined by optimal placement in 1995/96 compared to 1999/00 (Table 4.22). Specifically, there was no significant difference between the mean survival of residents who were optimally placed in SC in 1995/96 compared to 1999/00 (3.04 vs. 3.05 years, p=.216); who were optimally placed in SC+ in 1995/96 compared to 1999/00 (2.64 vs. 2.40 years, p=.275); or who required NH care in 1995/96 compared to 1999/00 (2.01 vs. 1.90 years, p=.794). Over time, the survival of clients optimally placed remained constant. This was an assumption used in accurately projecting future LTC bed need using optimal placement methods.

Table 4.22

Comparison of Mean Time to Death from Panel Assessment Defined By Optimal Placement Groups, Comparing 1995/96 & 1999/00 Cohorts

	1995/96			1999/00			
	n	*M*	95% CI	*n*	*M*	95% CI	P
Time to death							
SC	130	3.04	[2.7, 3.3]	144	3.05	[2.7, 3.4]	.216[a]
NH	133	2.01	[1.7, 2.3]	178	1.90	[1.6, 2.1]	.794[b]
SC+	94	2.64	[2.3, 3.0]	81	2.40	[2.0, 2.7]	.275[c]

Note. Statistical significance if $p < 0.05$. The 1995/96 cohort includes n= 357, 1999/00 cohort includes n=403; SC = Supervised care; NH = Nursing home; SC+ = supervised care for clients with cognitive impairment; M = mean time from assessment to death in years.

[a]Log Rank (Mantel Cox) statistic comparing SC groups between two time periods: chi-square=1.53, df=1, p =.216; [b]Log Rank (Mantel Cox) comparing NH between two time periods: chi-square=.068, df=1, p =.794; [c]Log Rank (Mantel Cox) comparing SC+ group between two time periods: chi-square=1.19, df=1, p =.275.

4.11 Annual Demand for Institutional Long Term Care

In determining the *actual* demand for LTC placement in the system, we assumed that 1) all those applying should be placed and 2) others who should be placed do not exist. It was necessary to account for the clients who were not included in the study because of the absence of data. In 1995/96, 84% of clients in the study were eligible for placement. Considering that 467 clients were seeking placement into LTC, and assuming that an equal proportion of those without data will not be eligible for placement, the actual demand for placement was 392 clients [(467 X 84)/100]. In 1999/00, 93% of clients in the study were eligible for placement. Since 464 clients were seeking placement at this time, the demand for placement was 431 [(464 X 93)/100]. Thus, over time, the actual demand for placement increased about 10%, from 392 in 1995 to 431 in 1999 while the total population of clients at risk $\geq$ 75 years also increased by 8% from 8,435 in 1996 to 9,074 in 2000.

In an effort to assess the demand for LTC, it was necessary to calculate the population rates of those clients eligible for placement into the system. Therefore, the demand for LTC for seniors $\geq$ 75 years was similar for 1996 and 2000. Population projections at the time of this study are shown in Table 4.23. With a population of 8,435 in this age group in 1996, the incidence rate was 46.5 [(392 / 8,435) X 1000] and with a population of 9,074 in 2000, the rate was 47.5 [(431 / 9,074) X 1000]. This trend was compared to data obtained from Community Health, St. John's Region on the number of applications recommended and approved from 2000 to 2003 calendar years. From 2000 to 2003, the total number of applications increased by 14%, from 478 to 546 (Table 4.24)

while the at risk population during this time increased by 7% (Table 4.23). The modest increase in incidence rates per 1000 population ≥ 75 years requesting placement into LTC was a concern because if this persists over the long term, predictions of need based on the current study and population projections may be inaccurate.

In 1999/00, 28% (n=121) of clients were recommended into SC while 72% (n=310) were recommended into NH by the panel. Thus, the population rate for SC was 13.3 per 1000 population ≥ 75 years [(121 / 9,074) X 1000] and the rate for NH was 34.2 per 1000 population ≥ 75 years [(310 / 9,074) X 1000].

As noted above, the actual demand for placement increased from 1995/96 to 1999/00, as the number of people ≥ 75 years increased. Between these time periods, the number of clients placed into the system decreased, as seen in Table 4.25. In 1998/99, 428 clients were placed into LTC compared to 360 in 1999/2000. These trends are reflected in the increased size of the waitlist during this time. Table 4.26 shows that in November 1998, the number of clients on the waitlist at that moment in time was 149 compared to 220 in November of 2000.

From 2000 until 2003, similar trends are apparent. The total number of applicants increased from 478 in 2000 to 546 in 2003. Although more clients were placed in 2003 than 2000 (394 vs. 360), it was not enough to compensate for the increased demand and therefore the waitlist had increased during this time. In November 2000, 220 were approved and waiting placement compared to 299 in 2003.

Table 4.23
Population Projections for St. John's Community Health Regional Boundaries

Year	*Total*	*Age (years)*				*Total*	*% increase*
		75-79	*80-84*	*85-89*	*90+*	*age ≥75*	*(from yr 2000)*
1996	185,552	3,910	2,655	1,308	562	8,435	
2000	183,521	3,944	2,866	1,600	664	9,074	
2001	182,454	4,079	2,912	1,600	702	9,293	2%
2003	183,992	4,177	3,052	1,625	839	9,693	7%
2004	184,878	4,259	3,021	1,647	891	9,818	8%
2006	186,169	4,354	3,035	1,733	951	10,073	11%
2014	191,806	4,813	3,313	1,913	1,061	11,100	22%
2018	194,030	5,898	3,512	2,009	1,135	12,554	38%

Table 4.24
Total Applications Recommended and Approved By the Panel for Long Term Care (LTC)

	Year			
Care Levels[a]	2000	2001	2002	2003
Level 1	100	130	161	147
Level 2	98	95	98	91
Level 3	280	337	323	308
Total	478	562	582	546

Note. Source - Health and Community Services, St. John's Region.

[a]Levels of care that clients are assigned at assessment when applying for LTC. These are assigned to clients with lower level needs to higher level needs, from one to three, respectively.

Table 4.25
Number of Clients Annually Placed to Institutional Long Term Care (LTC)

	1998-1999	1999/2000	2000/2001	2001/2002	2002-2003
SC	125	104	113	146	153
NH	303	256	263	301	241
Total	428	360	376	447	394

Note. Source: Health and Community Services, St. John's Region. SC = supervised care, NH = nursing home.

Table 4.26
Institutional Waitlist

	1998	1999	2000	2001	2002	2003
Level 1	39	53	83	106	89	80
Level 2	50	58	62	62	97	93
Level 3	60	80	75	101	151	126
Total	149	191	220	269	337	299

Note. Source - Health and Community Services, St. John's Region

[a]Levels of care that clients are assigned at assessment when applying for LTC. These are assigned to clients with lower level needs to higher level needs, from one to three, respectively.

4.12 Future Demands for Institutional Long Term Care

To estimate the future demands of institutional LTC, two methods of placement were used. These included placement decisions in the St. John's region by the panel and the optimal placement using the decision algorithm suggested in this study. Conventionally, clients requesting LTC were interviewed and assessed by a multi-disciplinary panel and given a level of care required, from one to three. There were no set criteria for assessing level of care needed. For the purpose of this study, SC was defined as care in a PCH or in a Level one nursing home bed. NH was defined as level two or three nursing home bed. Some clients with CI were admitted to SC but the majority were admitted to NH. The optimal method of placement was defined by set criteria in this study, including the presence or absence of RUGs clinical indicators, the ARCS levels of disability and the presence or absence of CI. These criteria were used consistently to assess all clients requesting placement into LTC at that point in time.

A number of assumptions were tested in this study. The annual incident rate of clients seeking LTC was not significantly different between the 1995/96 and 1999/00 cohorts. It was assumed these rates would remain constant over time. In addition, the population projections were assumed to be accurate. Therefore, the rate for placement would remain constant at 47.5/1000 $\geq$75 years and subsequently an overall increase in the demand for placement would occur as the total population $\geq$ 75 years continues to increase.

There were no significant differences in survival between the 1995/96 and 1999/00 cohorts so it was assumed this would remain constant. The average survival of clients recommended to SC was 3.02 years and for clients recommended to NH care 2.23 years. If defined by optimal placement, the average survival was 3.05 for SC, 1.90 years for NH care, and 2.39 years for SC for CI.

It was assumed that the needs of the clients requesting LTC would be constant. This assumption was based on the fact that the disability characteristics were not significantly different between the 1995/96 and 1999/00 cohorts in this study.

4.12.1 Long Term Care Bed Requirements in 2004 Using Current Methods.

At the time this research was conducted, population projections showed a population of 9818 ≥ 75 years for 2004. This equated to a demand of 466 clients using a rate of 47.5 [(47.5)(9,818)/(1000)] = 466. Using the current methods of placement at that point in time, 28% (n=130) were recommended into SC and 72% (n=336) into NH.

The number of SC beds required for a population of 9,818 ≥ 75 years in 2004 was projected to be as follows: [(annual incidence) (survival of SC)] = [(130) (3.02)] = **393 SC beds.** The number of NH beds required for a population of 9,818 ≥ 75 years in 2004 was projected to be as follows: [(annual incidence) (survival of SC)] = [(336) (2.23)] = **749 NH beds.** In 2004, the actual bed allocation was **562 SC beds** and **972 NH beds**.

4.12.2 Optimal Long Term Bed Requirements in 2004.

Based on the decision tree, 36% (n=168) should have been placed into SC, 44% (n=205) into NH, and 20% (n=93) into SC for the cognitively impaired.

The number of SC beds required for a population of 9,818 ≥ 75 years in 2004 was projected to be as follows: [(annual incidence) (survival of SC)]=[(168) (3.05)] = **512 SC beds.** The number of NH beds was projected to be: [(annual incidence) (survival of SC)] = [(205) (1.90)] = **390 NH beds.** The number of SC beds for those cognitively impaired was projected to be: [(annual incidence) (survival of SC)] = [(93) (2.39)] = **222 SC beds for CI.**

4.12.3 Long Term Care Bed Requirements in 2014 Using Current Methods.

It was predicted that 11,100 seniors ≥ 75 years would be present in this region in 2014. This equates to a demand of 527 clients a year for LTC using a rate of 47.5/1000 population ≥ 75 years.

If 28% (n=148) were recommended into SC, and 72% (n=379) were recommended into NH, the number of SC beds required was projected to be: [(148)][3.02] = **447 SC beds** and the number of NH beds was projected to be: [(379) (2.23)] = **845 NH beds.**

4.12.4 Optimal Long-Term Bed Requirements in 2014.

If 36% (n=190) were placed into SC, 44% (n=232) were placed into NH, and 20% (n=105) were placed into SC for the cognitively impaired, the number of SC beds required for a population of 11,100 ≥ 75 years in 2014 would be: [(190) (3.05)] = **580 SC beds;** the number of NH beds required would be [(232) (1.90)] = **441 NH beds;** and the number of SC beds for CI would be [(105) (2.39)] = **251 SC for CI beds.**

4.13 Long Term Care Bed Requirements by Geography

At the time of this study, current bed numbers and geographical bed distribution were used to determine LTC requirements within the city of St. John's and outside the city (Tables 4.27 and Table 4.28).

Using current LTC options (Table 4.27), over time the deficit of SC beds in the city would grow (141 to 173) and the excess of SC outside the city would decrease (310 to 265). This was not surprising as the demand for these beds increase over time with the aging population. This is true for NH beds as the excess of NH beds in the city would decrease (511 to 453) and the deficit of NH beds outside the city would worsen (288 to 326). There would be a deterioration in the provision of LTC as there would be an increased need for LTC beds in some areas. Also, the number of unused beds would decrease, a further expense to the system.

If restructuring was planned using the optimal LTC scenario (Table 4.28) with the development of specialized facilities for the CI, 151 and 100 specialized beds would be required for clients with CI, inside and outside the city, respectively. At the time of this study, none of these specialized facilities existed.

Using optimal methods (Table 4.28), a greater excess of NH beds would have existed in the city in 2004 (726) compared to current methods of placement (511) (Table 4.27). The same is true for 2014 (692 vs. 453). There were only 12 NH beds outside the city of St. John's at the time of this study. In addition, in 2014 using optimal methods (Table 4.28), there would be a greater deficit of SC beds in the city (253) compared to current methods (173) and smaller excess outside the city (235 vs. 265). There were only

95 SC beds available inside the city where the majority of the at-risk population resided, compared to 467 available outside the city.

This restructuring would necessitate new SC for CI inside and outside the city, new SC in the city, and substantial downsizing of NH.

As the numbers illustrate, optimal placement of clients would lead to a more cost effective LTC system. These projections using optimal placement showed an excess of NH beds in the city. These resources could be used toward less expensive SC beds since a deficit of SC beds in the city would exist. These extra resources would also help support appropriate specialized facilities for clients with CI.

Table 4.27
Institutional Long Term Care (LTC) Bed Requirements for St. John's Community Health Region in 2004 & 2014 Using Current Methods of Placement

	2004	2014
Demand for Placement	466	527
% Supervised Care	28%	28%
N Recommended to SC	130	148
Mean Survival	3.02	3.02
N SC beds Required	393	447
N SC beds Required in the city	236	268
N Available in the city	95	95
N SC (DEFICIT)/EXCESS in the city	(141)	(173)
N SC Required outside the city	157	202
N SC beds available outside the city	467	467
N SC (DEFICIT) / EXCESS outside the city	310	265
% Nursing Home Care	72%	72%
N Recommended to NH	336	379
Mean Survival	2.23	2.23
N NH beds Required	749	845
N NH beds Required in the city	449	507
N NH beds Available in the city	960	960
N NH (DEFICIT)/EXCESS in the city	511	453
N NH Required outside the city	300	338
N NH beds available outside the city	12	12
N NH (DEFICIT) / EXCESS outside the city	(288)	(326)

Note. Assumptions included a demand rate of 47.5 seniors ≥ 75 years every year, a population of 9,818 in 2004 and 11,100 in 2014, survival of 3.02 in SC and 2.23 in NH, constant bed numbers and consistent distribution of placement into SC and NH.

Table 4.28
Institutional Long Term Care (LTC) Bed Requirements for St. John's Community Health Region in 2004 & 2014 Using Optimal Methods of Placement

	2004	2014
Demand for Placement	466	527
% Supervised Care	36%	36%
N Recommended to SC	168	190
Mean Survival	3.05	3.05
N SC beds Required	512	580
N SC beds Required in the city	307	348
N Available in the city	95	95
N SC (DEFICIT) / EXCESS in the city	(212)	(253)
N SC Required outside the city	205	232
N SC beds available outside the city	467	467
N SC (DEFICIT) / EXCESS outside city	262	235
% Nursing Home Care	44%	44%
N Recommended to NH	205	232
Mean Survival	1.90	1.90
N NH beds Required	390	441
N NH beds Required in the city	234	268
N NH beds Available in the city	960	960
N NH (DEFICIT) / EXCESS in the city	726	692
N NH Required outside the city	156	176
N NH beds available outside the city	12	12
N NH (DEFICIT) / EXCESS outside the city	(144)	(164)
% Supervised Care for CI	20%	20%
N Recommended to SC for CI	93	105
Mean Survival	2.39	2.39
N SC beds for CI Required	222	251
N SC beds for CI Required in city	133	151
N SC beds for CI Available in city	0	0
N (DEFICIT) / EXCESS in the city	(133)	(151)
N SC beds for CI Required outside the city	89	100
N SC beds for CI Available outside the city	0	0
N (DEFICIT) / EXCESS	(89)	(100)

Note. Assumptions include a demand rate of 47.5 seniors ≥ 75 years every year, A population of 9,818 in 2004 and 11,100 in 2014, survival of 3.05 in SC, 2.39 in SC for CI, and 1.90 in NH, constant bed numbers and consistent distribution of placement into SC and NH. SC = supervised care, NH = nursing home.

Chapter 5

Discussion

This chapter will provide an interpretation of the results for this project and is divided into nine main sections. These sections are formed based on the specific research questions that were asked in this study. These include: 1) Is the incidence rate of clients for LTC staying the same? 2) Has the single entry system increased the appropriateness of placement? 3) Is the degree of disability of clients for LTC changing? 4) Is prognosis remaining constant? 5) What are the risk factors for death in LTC? 6) Is bed utilization inappropriate? 7) Are housing alternatives for the CI more appropriate than NH beds? 8) Will there be a LTC bed crisis in the future? The following question is also addressed in this discussion: Is home care a better option for government and seniors? The limitations of this study will also be addressed.

5.1 Is the Annual Incidence Rate of Clients for Long Term Care Staying the Same?

The number of people eligible for placement in this study was a result of the number of clients seeking placement into LTC minus those that were referred out of region, who made a precautionary application or who withdrew. An adjustment was made to account for those individuals which data was not available.

From 1995/96 to 1999/00, the at-risk population ≥ 75 years increased by 8% from 8435 to 9074. The number of individuals who were seeking LTC placement increased by 10% (392 to 431). This resulted in a marginal incident rate change of 46.5 to 47.5/1000 ≥ 75 years of age, over four years.

Alcock, Angus, Diem, Gallagher, & Medves (2002) stated that a decline in LTC admissions has occurred. Developments in pharmaceuticals and medical technology; higher disposable income levels; increased attention to healthier lifestyles and increased emphasis on early detection and disease prevention has contributed to this trend.

A more recent study stated that the pressure on public health and LTC providers may ease in the future as a result of a higher proportion of elderly people living with a partner; more elderly enjoying better socioeconomic circumstances; and shorter durations of care among these groups once in LTC (Martikainen, et al., 2009). The potential reversal in the proportion of elders living alone may occur as a result of increased life expectancy, in particular a reduction of gender differentials in mortality, and higher proportions of married cohorts now entering the elderly phase. The baby boom generations in many countries will be better educated and enjoy higher incomes in retirement (Martikainen, et al., 2009).

Cohen (2003) feels that in the previous 20 years, institutionalization has declined, but states that the demand for LTC will likely grow quite dramatically in the future as the population ages.

Our study suggested that there was an increased demand for LTC as the number of individuals eligible for LTC placement increased. The population of elderly ≥75 years increased and accounted for nearly the entire increased demand. The incidence rate per 1000 elderly ≥75 years remained unchanged. The number of seniors in the community increased and the number of clients seeking placement increased modestly.

However, there was an increase in the number of people seeking placement after 2000, disproportionate to the increase in the population ≥ 75 years.

5.2 Has The Single Entry System Increased the Appropriateness of Placement?

A single point of entry ideally allows the client a *one stop shop* which should ensure only those persons with demonstrated needs are admitted to NH care and that the appropriate level of care and other services are provided (Chan & Kenny, 2001; Public Health Agency of Canada, 2009). Implementation of a single entry system in St. John's was associated with a more appropriate case mix of NH residents when residents in 1997 were compared to those in 2003. Compared to 1997, NH residents in 2003 had a decreased length of stay; a smaller proportion had no indications for NH care; a greater proportion were clinically complex and needed special care; and fewer had a low level ARCS.

Chappell, Havens, Hollander, Miller, & McWilliam (2004) concluded that the two Canadian jurisdictions included in their study had an efficient single entry system and suggested that this was one characteristic that contributed to cost effective delivery of health care. They also stated that needs based screening increases the cost effectiveness of home care services. The advantages of the single entry system are well appreciated and no studies were identified that suggested otherwise. Most provinces in Canada have implemented or are in the process of implementing the single entry system or a variation of it. This will likely contribute a more effective and efficient LTC system across Canada. Although St. John's implemented a single entry system, the problem is that it doesn't involve a single entry to *all* LTC options. The institutional LTC sector was kept separate

from other services. Three regional boards have been responsible for delivery of care, including one for acute care institutions, one for LTC, and one for community care (McDonald, et al., 2005). This has resulted in the fragmentation of services, and consequently, clients may not be provided with the most appropriate care. Furthermore inappropriate admissions of clients to NHs persisted because the optimal mix of LTC options were not available. A deficit of SC beds in the city of St. John's together with an excess of NH beds ensured that clients with low or modest disability were admitted to NH. Furthermore, SC beds in the rural part of the region were unoccupied, likely because more people lived in the city. This maladapted system is not only costly to the health care system for LTC but impacts on the acute sector, because long waiting times for admissions to NH ensures that medically discharged patients stay in acute care beds.

5.3 Is the Degree of Disability of Clients for Long Term Care Changing?

There were relatively few Canadian research studies that described the care needs of people seeking institutional placement (Wilson & Truman, 2003). However, there was no doubt that client's seeking LTC placement were advanced in age. In the St. John's Region of Newfoundland, the average age of clients seeking LTC was 81 years, with 80% greater than 75 years of age. The average age of the cross section of residents in NHs was 82 years. These values did not change over time.

In Canada, the average age of residents in LTC facilities was greater than 80 years, with the majority of residents being over 74 years (Allard, et al., 2004; Bravo, Dubois, De Wals, Hebert, & Messier, 2002; Fisher, et al., 2003; Hughes, McDonald, Barrett, & Parfrey, 2008). Studies in the United States showed the majority of LTC

residents were over 74 years of age (Borrayo, Salmon, Polivka, & Dunlop, 2002); half of the LTC residents were greater than 84 years (Kiely & Flacker, 2003); and the mean age of LTC residents was 78 years (Cai, Salmon, & Redgers, 2009). The advanced age of LTC residents was not only a North American phenomenon. The majority of LTC residents were over 80 years in a Finland study (Martikainen, et al., 2009). Studies showed that the mean age was 85.5 years in the Netherlands (Meijer, Koopmanschap, Koolman, & Doorslaer, 2009); 83 years in Ireland (McCann, O'Reilly, & Cardwell, 2009); and 79.5 years in Hong Kong (Lee, Chau, Hui, Chan, & Woo, 2009).

Females made up the largest proportion of residents in LTC. In this current study, approximately 65% of the population seeking LTC placement were female in the St. John's region, as were 75% of the residents in the NHs. These proportions did not change over time. Canadian studies showed similar results (Allard, et al., 2004; Bravo, Dubois, De Wals, Hebert, & Messier, 2002; Fisher, et al., 2003; Hughes, McDonald, Barrett, & Parfrey, 2008) as did those from the United States (Borrayo, Salmon, Polivka, & Dunlop, 2002; Cai, Salmon, & Redgers, 2009; Kiely & Flacker, 2003) and beyond (Lee, Chau, Hui, Chan, & Woo, 2009; McCann, O'Reilly, & Cardwell, 2009; Meijer, Koopmanschap, Koolman, & Doorslaer, 2009).

Chan & Kenny (2001) stated that the complexity of clients has been increasing as people are being discharged from acute care facilities sooner and need more complex post hospital care for longer periods. Additionally, those clients with multiple chronic conditions are living longer. The acuity and complexity of clients in the LTC system has increased significantly, whereas the resources have remained more or less the same (Chan

& Kenny, 2001; Gnaedinger, 2003). This was echoed by Wilson & Truman (2003) who found that care needs among LTC residents across Alberta substantially increased over a 12 year period. They found that a greater proportion of clients needed assistance with eating, toileting, transferring and dressing. Also, more clients had bowel or bladder incontinence and were prescribed more medications.

When the two St. John's incident cohorts were compared, no significant difference was found in the level of disability scores (ARCS). In contrast, when the RUGs was compared using *high care* clients (clinically complex and special care) to all *others* grouped together (impaired cognition, reduced physical function, and no indicators), the results showed that a significant difference existed. The proportion of high care clients increased from 17% to 24%, from 1995 to 1999. When the cross section of NH residents was analysed in 1997 and 2003, the 2003 sample was clinically more complex and a greater number of residents required special care. These results may be explained by the implementation of the single entry system and appropriate placement of clients into LTC institutions. Wilson & Truman (2003) suggested that the causes of rising care needs were not strongly correlated with population aging. An apparent increase in rising care needs in Alberta may be a result of more efficient LTC bed utilization due to a slowing or reduction in LTC beds. This was indicated by a declining number of those residents with minimal care needs who were admitted to LTC.

An American study *Forecasting the Nursing Home Population* stated that during the previous 20 years, the rate of institutionalization among the elderly has been declining, as age specific disability rates are falling. However, they found this trend was

unlikely to persist (Lakdawalla, Goldman, Bhattacharya, Hurd, Joyce, & Panis, 2003). Trends of declining disability would not persist since young and middle aged cohorts were more disabled, and experienced a greater incidence of complicated obesity and asthma. This study predicted that disability would increase after 2011 when the younger cohorts start working themselves into the system (Lakdawalla, Goldman, Bhattacharya, Hurd, Joyce, & Panis, 2003).

Dementia is one of the most common and challenging of chronic illnesses from which LTC residents suffer (Wilson & Truman, 2003). The risk of dementia increases with age and as a result of population aging, LTC facilities have more residents with CI than they did in the past (Chappell & Reid, 2000; Gaugler, Yu, Krichbaum, & Wyman, 2009). Wilson & Truman (2003) explained that a greater number of residents exhibited aggressive behaviour, wandered, were suspicious, engaged in inappropriate behaviour, were at risk of injury and had ineffective coping behaviours. In addition, more clients had problems with orientation to staff and had difficulty following instructions. In the current study, approximately one quarter of the clients seeking LTC placement had CI or behavioural problems. Although not statistically significant, the number of clients with CI decreased by 7% from 1995 to 1999. Although this study showed that clients with CI make up a significant proportion of LTC residents, it did not demonstrate a growing proportion of these clients over time.

5.4 Is Prognosis Remaining Constant?

The results of the current study showed that clients recommended for a NH lived approximately 2.5 years and clients recommended for SC lived slightly longer, approximately 3 years. Mortality remained constant over time, as survival was not significantly different between the two incident groups.

Studies suggested that mortality in the elderly, particularly in LTC, is generally similar across regions. Recently, one study aimed to quantify mortality rates amongst clients in nursing and residential homes in Northern Ireland (McCann, O'Reilly, & Cardwell, 2009). This prospective, census based cohort study included a five-year follow-up of 9072 residents in care homes for people aged 65 years and older. A median survival among NH residents was 2.33 years and 4.51 for residents in residential homes (McCann, O'Reilly, & Cardwell, 2009). The definition of residential homes was not clear in this study and therefore can not be compared directly to SC care. The survival for NH residents (2.33 years) was very similar to the current study (2.5 years).

In 2004, Allard et al published a study on the nutritional risk factors for survival in the elderly living in Canadian LTC facilities. The sample included clients over the age of 60 in 14 facilities who had been there for at least six weeks. Time to death was recorded at the time of enrolment and clients were followed for 19 months. The mean survival times for all subjects at 3, 6 and 12 months were estimated from a survival graph and were approximately 95%, 90%, and 80%, respectively compared to 92%, 85%, and 74% in the current study. In the former, clients were excluded if they had a terminal disease which may account for the slightly higher survival.

A study in 2003, found a mean survival of 79% at the one-year follow-up period. The level of social engagement the client typically experienced was tested and showed that increased engagement had a protective effect on the one-year mortality (Kiely & Flacker, 2003). In St. John's, clients in NHs had a 69% survival and those in SC had 87% survival at one year. Combined, the incident cohorts had a survival of 74%, similar to the study findings of Kiely & Flacker (2003) mentioned above.

A three-year follow-up study of 299 residents from 88 LTC facilities in the province of Quebec, Canada was conducted to assess the mortality rate of LTC residents. The effect of care quality on the clients length of survival was also assessed (Bravo, Dubois, De Wals, Hebert, & Messier, 2002). This study compared clients in regulated and unregulated facilities. Regulated facilities were subjected to standards and periodic inspections. Unregulated facilities, which house 60% of LTC residents, are only inspected when a client or family member launches a formal complaint. Median survival was 28 months (2.33 years) among residents classified as receiving inadequate care compared to 41 months (3.42 years) for those adequately cared for. This study suggested that quality of care has a strong influence on resident outcomes. The median survival for the latter group was very similar to our study.

It appears the findings in the current study are generally in keeping with those produced in other studies though direct comparision of mortality rates is difficult. Many factors influence mortality rates, such as different entry criteria into a LTC facility and differences in resident case-mix.

Using objective criteria to classify clients, a decision tree was constructed to determine optimal placement of clients into LTC. As expected mortality differed when optimal vs. actual placement was compared. Survival was highest in those who needed SC, lower in those who needed SC for CI, and lowest in those who needed NH care. The Canadian Study of Health and Aging found that mortality ratios rose with increased severity of CI and in those with dementia it was increased even further (McDowell, Hill, & Lindsay, 2001). In the current study, the severity of CI was not evaluated.

Appropriate placement of residents would result in the sickest clients residing in the most expensive nursing beds, with high turn over of clients resulting in the most efficient utilization of resources.

5.5 What are the Risk Factors for Death in Long Term Care?

Various factors independently predicted death. The multivariate model in the current study revealed the following risk factors: males (HR 1.59, 95%CI [1.30,1.95], p=.000), all RUGs groups including special care (HR 2.16, 95%CI [1.21, 3.86], p=.010), clinically complex (HR 1.95, 95%CI [1.36, 2.81], p=.000,), impaired cognition (HR 1.44, 95%CI [1.07, 1.95], p=.017,) and reduced physical function (HR 1.97, 95%CI [1.36, 2.84], p=.000). Age was also significantly associated with death (HR 1.02 per year, 95%CI [1.01, 1.03], p=.000).

In a multivariate analysis conducted by Allard, et al., (2004) in Canadian LTC facilities, males were associated with an increased risk of mortality (HR 1.7, CI [1.2-2.7], p= .0096). This is similar to the current study. Functional status was measured using Katz ADL, divided into three groups only: totally independent, partially dependent, and totally

dependent. Although functional impairment was expected to be significant, the authors state that most patients had impairment and that only 9% were independent, a possible explanation for the failure to demonstrate association between functional status and death.

A study in the United States using multinominal logistic regression analysis, found that age (HR 1.12, 95%CI [1.12,1.13] p<.0001) and male gender (HR 1.82, 95%CI [1.67, 1.98] p<.0001) were positively associated with death (Fischer et al, 2003). These factors were also significant in the St. John's Region in Newfoundland. They also found that differences in health as measured by the Chronic Disease Score (CDS) was also a significant predictor, but this cannot be directly compared as the measurement tools used to assess disability in the current study were RUGs and ARCS, not the CDS.

Predictors of mortality in NH residents who were at least 65 years old were also studied (Kiely & Flacker, 2003). Resident characteristics were obtained using the MDS, and many were found to be positively associated with death. These included, but were not limited to, functional impairment, recent weight loss, swallowing problem, unstable conditions, and shortness of breath. This reinforces the ability of the MDS to predict death. As well, males were 1.5 times more likely to die faster than females (95%CI [1.41, 1.57], p<.05) as were older clients ≥ 84 years (HR 1.26, 95%[CI 1.20, 1.33], p<.05). In addition, CI predicted earlier death, but the specific effect was not stated in the study. It was noted that although it was statistically significant, the strength was relatively weak (Kiely & Flacker, 2003).

Lee, Chau, Hui, Chan, & Woo (2009) found similar factors associated with mortality as the current study. They found that older age at NH admission (HR 1.036, 95%CI [1.028, 1.045], p<0.001) and men (HR 1.077, 95%CI [1.651, 2.175], p<0.001) were associated with shorter survival after NH admission in multivariate analysis. They also found that higher impairment levels were associated with a shorter survival measured by multiple MDS scales, including one specific for cognitive performance (Lee, Chau, Hui, Chan, & Woo, 2009). Again, the current study used the RUGs-III and ARCS as assessment tools which could not be directly compared.

It was clear that men and age were independent predictors of mortality and this was consistent with the findings of the current study. Although studies used different assessment tools, it was clear that the level of disability, whatever way it was measured, was also an important factor for predicting survival. Interestingly, most studies used variations of the MDS, which is what the RUGs-III was constructed from. Therefore, although the tools cannot be directly compared, they are likely representing the same fundamental characteristics of disability that predict death.

5.6 Is Bed Utilization Inappropriate?

When a comparison was made between the number of residents recommended to SC and NH care by the single entry panel and optimal placement using a decision tree, 25% of residents were actually referred to SC, whereas 36% required this care. This dependence on NH care was caused by the lack of alternative, accessible SC facilities, and by the availability of excess NH beds in the city of St. John's. Outside the city an excess of PCH beds existed with short wait times, but they were an unrealistic option for

city dwellers. Investments were not made in alternatives to NH care for clients with modest disability in the St. John's Region.

A study found that a person living in an area with higher than average NH bed supply was almost twice as likely to have a permanent NH stay than a person living in an area with a lower bed supply (Borrayo, Salmon, Polivka, & Dunlop, 2002). Use of a NH bed by a client with a low level of disability reduces access to NHs because these clients have a longer survival.

Studies conducted in Newfoundland have suggested that LTC bed utilization is inappropriate (Hughes, McDonald, Barrett, & Parfrey, 2008; Reddy, 2002; Stuckless, 2000). When five health regions were assessed, the incidence rate of residents recommended for NH care was 36/1000 population ≥ 75 years. 22% of these residents had low levels of resource utilization but 15% had no RUGs-III clinical indicators for NH placement. In addition, regions with the highest proportion of NH residents were those with the highest rate of NH beds: St. John's and the Western region (Hughes, McDonald, Barrett, & Parfrey, 2008). In another study that assessed the Western and Labrador regions, the same trends were found. In the Western region, the single entry system placed 65.2% of residents in NH care when only 39.9% required NH care when placed optimally by the research team. When the Labrador region was assessed, 78.4% of residents were placed in NH care by single entry system when only 33.3% of residents were found to require this level of care by optimal assessment (Stuckless, 2000).

Individuals seeking placement into LTC in St. John's would receive more appropriate care if more SC care beds were available or if a *true* single entry system was in place to control access to institutional LTC and other types of care such as home care.

Cohen (2003) stated that shortfalls in LTC beds in British Columbia translated into longer waitlists, increasing by 76% from 1993 to 1999. In St. John's, the increase from 1998 to 2003 showed a similar trend, increasing by almost 100% during that time.

Inadequate access to LTC facilities leads to longer stays in acute care beds as clients wait for placement. About 13% of acute care patients in British Columbia were in acute care because of the lack of long term, rehabilitation and community services (Cohen, 2003). In the St. John's Region of Newfoundland, 7% of the total inpatient days within the Cardiology, Medicine, and Surgery Programs were attributed to delays in transfer of medically discharge patients to LTC (McDonald & Parfrey, 2004).

The cognitively impaired require care that is unique to their needs, rather than NH care they receive in NH beds. Inappropriate bed utilization has been identified, as a significant proportion of the resident population in the current study had CI as the only indicator for NH care. This has also been identified in previous studies (Hughes, McDonald, Barrett, & Parfrey, 2008; Stuckless, 2000). As a result, it has been suggested that these clients should be placed in specialized care instead of NH care. This would decrease costs as a smaller number of expensive NH beds would be utilized and allow for those with greater needs to be placed faster. In addition, clients with CI would receive care that is more suited to their needs.

5.7 Are Housing Alternatives for the Cognitively Impaired More Appropriate than Nursing Home Beds?

A number of published articles have addressed the unique demands and LTC needs of residents with CI and behaviour problems (Boyd, Mitchell, & Malm, 2009; Chappell & Reid, 2000; Feng, et al., 2009; Gnaedinger, 2003; Grant & Potthoff, 1997; Lesage, Gelinas, Robitaille, Dion, Frezza, & Morissette, 2003; Mitchell, et al., 2009; Schindel-Martin, Morden, Cetinski, Lasky, McDowell, & Roberts, 2003; Voyer, Richard, Doucet, & Carmichael, 2009; Young, Binns, & Greenwood, 2001). Since the needs of this group were so different from clients that are cognitively intact, better housing alternatives for clients with CI and who have behavioural problems may be preferable to current NH care, to more appropriately and efficiently care for this special group. This evidence arguing against the appropriateness of the 'typical' LTC facility for the cognitively impaired should induce policy makers to provide specialized facilities for this group of clients.

Lesage, Gelinas, Robitaille, Dion, Frezza, & Morissette (2003) studied the availability and utilization of residential resources to determine the capacity of a comprehensive system of care. This study included a catchment area of a psychiatric hospital in Montreal, Canada. It was found that the need for SC facilities was high, that an overprovision of care was occurring, and that users could be moved to facilities that allowed more autonomy. Individuals would benefit from their own accommodations outside of long stay institutions such as hospitals (Lesage, Gelinas, Robitaille, Dion, Frezza, & Morissette, 2003). Although this study focused on individuals with a variety of

cognitive problems, it supported the idea that clients with cognitive alterations were over-placed in facilities offering a high level of nursing care, and that this placement was cost inefficient and not the best for the well-being of these clients.

In the St. John's region, patients were admitted to NHs when the only clinical indicator for this type of care was CI. These residents should be in a facility which utilizes less expensive nursing care and instead emphasizes flexibility, working in smaller groups, providing residents with familiar surroundings (Gnaedinger, 2003) and avoiding managements such as physical restraints and antipsychotic use (Feng, et al., 2009). In addition, routine practices such as meal delivery could be changed to better meet the needs of residents with CI (Young, Binns, & Greenwood, 2001). With specialized facilities, caregivers in LTC would likely become experts in terms of the best ways to handle difficult situations. Training programs could be directed at these facilities and their caregivers to improve the work environment and the care of the LTC client (Schindel-Martin, Morden, Cetinski, Lasky, McDowell, & Roberts, 2003).

The high incidence of clients with CI requiring LTC suggests that alternatives which are more flexible and customized are necessary. The development of a closer link between services and needs will become increasingly important for policy makers as the population needing LTC grows and the pressure on resources mounts over the next several years.

5.8 Will There Be A Long Term Care Bed Crisis in the Future?

A combination of inappropriate utilization of NH beds, inefficient placement of NH applicants (despite an excess of NH beds), a geographic imbalance of SC beds, and

lack of specialized facilities for those with CI has occurred in the St John's region. This has resulted in a serious mismatch between the needs of this population and the services provided.

At the time of this study, there were only 95 SC beds in the city, leaving a deficit of 208 SC beds by 2014 if optimal restructuring was planned. There was a large excess of SC beds outside the city resulting in a waste of resources that were unavailable geographically to those who needed them. The majority of SC beds were in personal care homes, which are private, for-profit facilities that exist primarily outside the city. This may be the result of high land costs and high city taxes, therefore, a potential financial disincentive (Reddy, 2002; O'Reilly, Parfrey, Barrett, & McDonald, 1998).

A surplus of NH beds existed in the city. Negative perceptions of PCHs (the majority of SC) existed because they were privately funded and assumed by many applicants and their families to have lower standards when compared to publicly funded NHs (Reddy, 2002). A large deficit of NH beds outside the city left many clients without adequate and convenient care, frequently having to move away from their families to access adequate care in the city.

Compared to current LTC options, optimal methods would require fewer NH beds. This is arguably the most expensive of LTC options (Lesage et al, 2003), and hence this would be more favourable. The total increase in beds needed was projected to be 75 for SC beds and 251 SC beds for CI, both cheaper and more appropriate alternatives.

In 2004, in the St. John's region, there was a mismatch between the beds needed and the services provided, and this mismatch will likely deteriorate further in the next

decade. Without changing the distribution of NH and SC beds inside and outside the city, an inefficient and inconvenient imbalance would continue to strain the LTC system to the point it may not be sustainable into the future as the population ages and demand for LTC increases. Without unique facilities for clients with CI and specialized needs, these clients would continue to utilize expensive NH beds unnecessarily and continue to be inappropriately cared for.

5.9 Is Home Care a Better Option for Government and Seniors?

Regardless of the population structure and demands on the LTC sector, residential NH and SC facilities will always be required and will be the care of choice for some Canadians and their families. Restructuring these beds needs to occur in this province to provide efficient care for our seniors. However, literature has suggested that more attention should be paid to home care and expanding its role in today's society (Brody, Simon, & Stadler, 1997; Chappell, Havens, Hollander, Miller, & McWilliam, 2004; Manitoba Nurses Union, 2006; Sarma & Simpson, 2007). The central belief underlying the emphasis on basing LTC in the community is that from the residents perspective, living at home is often preferable to living in an institution (Brody, Simon, & Stadler, 1997; Manitoba Nurses Union, 2006).

Home care has been limited in the St. John's region. McDonald et al (2005) outlined that at that point in time, this province had not invested in home care services despite the fact that at least 12% of the 1995/1996 cohort could have been managed at home and home care may be less costly than residential care. More recently, however,

this trend appears to be changing, as part of the Newfoundland budget 2009 included eight million dollars to address growth in the home support program over 2009/2010.

Chappell, Havens, Hollander, Miller, & McWilliam (2004) published a study conducted in British Columbia and Manitoba which examined the cost effectiveness of home care as a substitution for institutional LTC. They described by the late 1980s and until the late 1990s, research supported the argument that home care was actually a more expensive option than residential LTC for seniors and that it did not actually decrease the demand for institutional care. As a result, the Canadian government was concerned about the ability to adequately fund care, and therefore supported research in this area. This study included residents that required the same level of care, and compared costs of home care and residential care in both settings. The findings of this study concluded that home care costs $32,218 for intermediate care clients in Victoria and $64,715 for facility care. In Manitoba, home care costs were calculated to be $27,518 and for facility care it was $59,292. This suggested that an expansion of home care services in these two provinces and across the country could be beneficial, even when you take into account the costs of informal care (Chappell, Havens, Hollander, Miller, & McWilliam, 2004). A Manitoba study conducted a multinomial logit analysis of elderly living arrangements and concluded that home care reduces the probability of living in a NH (Sarma & Simpson, 2007).

In our study we showed that there was an urgent need for alternative models of SC housing for clients in the city of St. John's who needed additional assistance but not professional NH care. The use of high level NH beds by low level clients has created an

apparent shortage of NH beds. To optimize the use of NH beds, other alternatives are necessary before the number of NH beds can be reduced. This principle is consistent with Chappell, Havens, Hollander, Miller, & McWilliam (2004) when they state "to cut facility beds, unaccompanied by an expansion of in home-care services, is not enhancing the efficiency of care - it is just depleting care" (pg.398). Provision of these alternate care options for LTC would decrease the costs of LTC because St. John's has been depending on the highest cost model to provide care to those with modest disability.

5.10 Limitations of the Study

Data for this study was collected by different researchers over time and data contained in the databases was also inserted by different researchers. Collection of data on clients in the NH facilities involved charge nurses describing the needs of the patients in their unit. This information was used instead of direct observation by the assessors themselves. It is necessary to recognize that these professionals may be biased in their perceptions of their clients and workplace. Staff may be critical of their resources and work conditions during these times when issues surrounding LTC and health care in general have been controversial. Therefore, they may overestimate the needs and level of care of their clients. This could have resulted in an assessment that patients had more indicators for NH care in 2003 compared to 1997, inflating the effectiveness of the single entry system.

In addition, the NLCCA for Adult Long Term Care form was completed for all clients seeking placement into LTC through the single entry system. Many assessors in Health and Community Services fill out this form and thus the accuracy and quality of

this information cannot be controlled. Ideally, the same people would collect data for all the LTC residents used in this study to be sure that consistent assessments were made and accurate comparisons could be made between time periods. Therefore, in the current study we assumed that the collected information on residents was accurate and that variation between assessors was minimal.

The cross-sectional study of NH residents in 1997 and 2003 was helpful in obtaining a picture at two given times, but may over represent cases with long duration and underestimate cases with a short duration of stay. These prevalent cohorts were used to determine the impact of single entry on NHs, but the needs for NH beds was estimated using incident cohorts where incidence *times* survival could provide the number of beds required.

Chapter 6

Conclusions and Recommendations

At the time of this study, the St. John's region needed an integrated care model for the elderly. It was clear that restructuring was needed as the LTC system was inefficient and ineffective at providing efficient and quality care to individuals seeking placement into and residing in LTC. This study evaluated a number of issues and the following sections will outline a number of conclusions and subsequent recommendations that resulted from each conclusion. The conclusions and recommendations are divided into four main sections, and these include: The Single Entry System, The Inappropriateness of LTC Placement, The Prediction of LTC Needs, and Home Care.

6.1 The Single Entry System

A comparison of the characteristics of the 1997 and 2003 NH residents showed that the single entry system improved appropriateness of placement as the latter group had higher level of care needs, had more clinical indicators for NH care and had a shorter length of stay.

These results showed that the single entry system was a positive change to the LTC system. It was recommended that the St. John's region needs to invest in one regional health board responsible for acute care, LTC and community care. A true single entry system would be ideal so that individuals seeking placement into LTC would be assessed and placed in the type and level of care most suited to their needs. They would have all LTC options available to them at one time, so that their needs and services could be better matched.

6.2 Appropriateness of Placement

When the clients level of disability and resource utilization were assessed in relation to where the resident was recommended in LTC, it was found that they were often inappropriately placed. A significant proportion of residents were placed in NH care when they could have been managed in SC alone. In addition, a significant proportion of residents were placed in NH care when the only indicator for this care was cognitive impairment. Using the researchers decision tree, optimal placement of residents was determined. It revealed a decreased need for NH care, an increased need for SC care, and the need for specialized care for residents with cognitive impairment.

It was recommended that residents should be objectively assessed to determine their needs for LTC. This assessment should include the use of validated assessment tools to ensure that residents placed in NH care have a high level of need and/or clinical indicators for NH care other than CI alone. The St. John's region needed investments in specialized facilities for residents with CI to better meet their needs and to reduce dependence on expensive NHs. A reduction in NH beds would result in savings that could be used to develop more SC facilities and to develop specialized facilities for residents with CI.

6.3 Prediction of Future Long Term Care Needs

A number of analyses were conducted comparing the 1995/96 and 1999/00 cohorts to test assumptions which enabled the needs for LTC in the future to be accurately predicted. We concluded that the incident rate of individuals seeking placement into LTC has remained constant and therefore we used this rate of need to

predict the future need. The demographic characteristics, degree of disability, time to placement into SC and NH, and survival time of residents in SC and NH had remained unchanged over time. Therefore we assumed that the projections would accurately reflect the needs and survival of residents as well as the efficiency of the system.

Future needs of LTC were projected using conventional methods of placement into SC and NH care. Needs optimally defined by the decision tree into SC, NH and SC+ were also projected. At the time of this study, projections to 2004 and 2014 were carried out.

Using optimal placement, a worsening deficit of SC beds and continuing excess of NH beds would occur in the city by 2014. An excess of SC beds and a deficit of NH outside the city would continue by 2014. A significant number of specialized SC beds for residents with cognitive impairment were needed both inside and outside the city. Compared to current options, optimal placement would result in much less dependence on expensive NH beds and the potential to transfer these resources into the SC sector.

This geographical mismatch of service and needs means that the St. John's region requires investment in more SC facilities in the city and more NH beds outside the city, in addition to a reduction of NH beds in the city and a reduction of SC beds outside the city.

6.4 Home Care

The current study was not intended to evaluate all aspects of home care. However, it was clear that residents were often placed in care that overestimated their needs. All LTC options, including home care, were not available to clients when they were assessed for LTC placement. These findings, in addition to the literature, suggested that home care is a valuable option for elderly requiring care. It may be a more inexpensive option of LTC and may prevent institutionalization. In addition, it is often the clients preferred choice to stay in their home.

It is recommended that home care services should be extended in the St. John's region to provide care that would help keep elderly in their homes for a longer period, help prevent institutionalization, and to help maintain a quality of life which the individual desires.

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APPENDIX I

Health and Community Services Boards: St. John's Region

APPENDIX II

Eligibility Criteria for Levels of Care

The eligibility criteria for the four levels of care are designed to assist the professional to group clients.

The minimum data set underlying the criteria is the provincial assessment tool for long term care. The categories of criteria include personal functions, mental status and medical status. The group set includes four levels based on key elements of description of need. A client may be a high level in one category and a low level in another; however, it is the professional judgement that determines the overall level of care requirement.

COMPONENTS

1. **Personal Functions**: The Applicant/Resident

Level 1

- Is independently mobile with or without mechanical aids inclusive of a wheelchair
- May need specialized aids for independently transferring.
- Will require limited assistance with bathing, dressing and /or grooming.
- May require reminder of routine toileting.
- May require minimal assistance with toileting.
- May need nutritional monitoring.
- May have sensory deficit which interferes with activities of daily living and may or may not require minimal assistance.

Level 2

- May be independently mobile with or without mechanical aids inclusive of a wheelchair
- May need specialized aids for independently transferring or one person assist.
- May need a moderate amount of assistance with bathing, dressing and grooming.
- May require reminder of routine toileting to avoid frequent incontinence of bowel and/or bladder
- Will require assistance with toileting to maintain cleanliness
- May need occasional fleet enema, as directed by physician.
- May require nutritional monitoring of and/or assistance with eating.
- May have sensory deficit which interferes with activities of daily living and requires moderate assistance.
- May need some supervision and assistance in eating.

Level 3

- Is dependent for transfer or mobility.
- May require assistance to turn and move about in beds
- Is dependent for assistance with dressing, washing, grooming and bathing.
- May have incontinence of bladder and/or bowel; May have indwelling catheter and require catheter care.
- Require supervision and assistance in eating or requires feeding.
- Requires daily professional care, i.e. surgical dressings, etc.
- May have sensory deficit which interferes with activities of daily living and requires ongoing assistance.

Level 4

See Medical Status/ level 4

2. Mental/Sensory/Perceptual: The Applicant/Resident

Level 1

- May have full use of mental functions
- May have a sensory/perceptual deficit but with adaptation will have the ability to be responsive, understand simple instructions, and express needs.
- May demonstrate mild difficulties in orientation to day, time and place.
- May demonstrate mild difficulty with memory and recall.
- May have inappropriate behavior which does not interfere with other people.

Level 2

- May have mental functioning with moderate cognitive impairment.
- Is responsive to verbal stimuli, may have some difficulty with simple instructions, number and time concepts.
- May have a sensory perceptual deficit but even with adaptation needs assistance for understanding and expressing needs.
- May tend to pace or wander in own environment but is not at risk for elopement.
- May demonstrate occasional inappropriate behaviour which may interfere with others which can be stabilized.

Level 3

- May have severe cognitive impairment.
- May have a sensory perceptual deficit and even with adaptation needs ongoing assistance for understanding and expressing needs.
- May present with management problems due to behavour, e.g., wandering, aggressiveness, hostility.
- May demonstrate varying degrees of difficulty with orientation to place or person.

Level 4

- Only responsive to tactile or painful stimuli or is non-responsive.
- See Medical Status/Level 4

3. Medical Status: The Applicant/Resident

Level 1

- May have medical problems that are stabilized and do not require daily professional supervision.
- May require accompaniment for (doctors, dentists, specialists, etc.) visits.
- May require therapies (e.g. oxygen concentrator, ventolin masks) or procedures (e.g. colostomies) and are able to independently complete care required.

Level 2

- May require therapies (e.g. oxygen concentrator, ventolin masks) or procedures (e.g. colostomies), but requires assistance to physically complete the task. May require assistance with set up and/or cleaning of equipment.
- Requires professional monitoring.

Level 3

- Has medical problems which require continuous supervision and may require frequent professional intervention.

Level 4

- May be technology dependent or need both a medical device to compensate for the loss of a vital body function and ongoing professional health care to maximize functioning or prevent further disability e.g. tracheostomy, enteral feed, vascular access device, mechanical ventilation.

Code:

Independent: - Able to perform all aspects of task independently, may use special devices.

Minimal Assistant: - Needs some assistance at all times in order to complete the task.

Moderate Assistance - Needs assistance at intervals to complete the task.

Constant Supervision -Needs constant supervision in order to complete the task.

Dependent - Unable to complete the task even when assistance is Provided.

Monitor: - Observe to check status or keep track of.
Supervision: - Critical watching to give direction.

APPENDIX III

Alberta Resident Classification System (ARCS)

The Alberta Resident Classification System for Long Term Care Facilities was developed to assist in determining the nursing care requirements of residents within LTC facilities. The aim in developing the classification system was to produce classification categories which grouped residents with similar types of care requirements and similar amount of nursing care needs. Eight indicators were found to predict variation in nursing resource use and these are derived from three care domains: Activities of Daily Living (ADL), Behaviors of Daily Living (BDL) and Continuing Care (CCl) . Each of these indicators measure the extent to which an individual requires assistance with or intervention for a particular activity, behavior, or care requirement.

Predictors within each of the three domains:

- **Activities of Daily Living (ADL) Indicators**

1. Eating
2. Dressing
3. Toileting
4. Transferring

- **Behavior (BDL) Indicators:**

5. Ineffective Coping
6. Potential for Injury to Self and Others

- **Continuing Care (CCL) Indicators:**

7. Urinary Continence
8. Bowel Continence

Nursing Resource Use for the ARCS Categories

Source - "Alberta Patient Classification System for Long Term care Facilities: Final Report" Semradek J et al.

Measure of resource use was computed from actual time spent by providers caring for patients. Both direct (face to face) and indirect care activities were included in measuring the time spent. Indirect care activities were defined as those tasks specific to an individual patient but not preformed in his or her presence. These included such items as charting, family consultation and coordination with other providers. To allow comparison across providers and summation of individual provider measures into a composite index, staff time was measured in a common unit, relative labor cost weights. (A minute of RN time was counted as a minute of RN equivalent time (relative weight = 1.00. Since RNA and NA salaries were lower than RN salaries, their weights were less than one; thus a minute of RNA time was less than a minute of RN time.

A resident's score on each of the eight indicators is combined using a series of decision rules which place the individual in one of seven classification categories. These categories labeled A through G are ranked ordered from low to high in terms of care requirements and resource use. Weights were assigned to each category based on the differences between the nursing resources used by residents in the seven categories.

Table 1

Mean Nursing Resource Use for ARCS Categories

Categories	Weighted Nursing time (RN, RNA, NA)		
	Mean	S.D.	Relative Weight**
A	30.92	18.36	1.00
B	43.21	23.63	1.40
C	59.68	24.47	1.93
D	69.88	31.78	2.26
E	89.57	34.88	2.90
F	105.12	37.90	3.40
G	119.20	44.32	3.86

Table taken from the "Alberta Patient Classification System for Long Term care Facilities: Final Report"
Semradek J et al.

****Relative weight= Mean Resource Use Category i ÷ Mean Resource Use for category A (i= A, B, C .... G.)**When these weights are standardized, with category A having a weight of 1.0, then resource use measures for the seven categories are noted above in Table 1.(*Category B resident requires, on average, 1.4 times as much nursing care time as a category A resident, and a category G resident requires 3.86 times as much)*

Alberta Resident Classification (ARCS) Category Definition –
Description of Type of Resident within each Category

Category 'A' - patients with low ADL's, low BDL's and non-med incontinence problems. They have little or no functional impairment who require minimal supervision, although they may require a supportive environment to function at their potential levels (e.g. patients prepared for independent living or who require supervision to prevent deterioration in their condition).

Category 'B' - patients with a low ADL and a med to high BDL, or those with a med-low ADL and a low to medium BDL. These combinations require about the same levels of care (e.g. patients with minor physical handicaps that require restorative rehab, or in patients with mild cognitive impairment- early Alzheimer's). Higher BDL's are offset by lower ADL's in this category. Patients with highest level of incontinence are excluded.

Category 'C' - comprise three clusters of patients. As in 'B', the clusters represent different combinations of ADL and BDL levels: lowest ADL with highest BDL, med-low ADL with high BDL and med ADL with low-med BDL levels. However, in 'C', the BDL's are higher for any given ADL level than they are for 'B'. Patients with highest level of incontinence are also excluded (patients with early stage multiple sclerosis requiring little physical care, but are emotionally liable, or stroke patients with moderate physical deficits who need emotional support).

Category 'D' - comprise the largest number of combinations: patients whose combined ADL and BDL would have put them in A, B, or C but who have incontinence of both bowel and bladder; patients with no or occasional incontinence if they have med-low ADL's and very high BDL's, med ADL's and high BDL's, or med-high ADL's and BDL's from low-high

(paraplegics having bowel/bladder retraining, younger CVA, MS, organic brain syndrome etc.).

Category 'E' - four different combinations: patients with lower ADL's must have either med-high CCL's or very high BDL's. Patients with med-low ADL's *only* if very high BDL's **and** need management or retraining for urinary incontinence. Those with medium ADL's and high BDL's and bladder management problems are also in this category. Patients with no or low incontinence are in this category only if they have very high BDL needs. Patients with med-high or high ADL requirements, whether they require management of urinary incontinence or have no incontinence, if they do not have very high BDL requirements (very frail, confused elderly, old stroke patient, severely arthritic patient, alcoholic with Korsakoff's syndrome, brain injured patient).

Category 'F' - primarily patients with heavy care requirements: highest ADL's who also have some incontinence problems. Without the highest ADL's a patient could fit in category F, if the physical care requirements (ADL and incontinence) are complicated by behavior problems. Patients with very high BDL's are not included unless they have lower ADL's (advanced dementia, bedridden, non mobile with incontinence, MS, or palliative care).

Category 'G' - Highest BDL's and med-high ADL's. Those with med-high ADL requirements must also have some incontinence (advanced neurological diseases such as MS, ALS, Huntington 's disease, Palliative Care, severe dementia requiring high physical care, severe rheumatoid arthritis).
The following matrix (below) determines the resident's classification category based on ADL, BDL, and CCL levels of care.
The letter from the cell in the matrix in which the resident's appropriate ADL, BDL, and CCL levels meet, is the Resident Classification Category (A-G) for the individual.

Matrix for Classifying Residents

Based on Activities of Daily Living, Behavior of and Continence Levels

ADL Level	BDL Level	CCL (Continence Levels)			
		0 -None	1 - Low	2 - Med	3 - High
1--Low	1-Low	A	A	A	D
	2-Med	B	B	B	D
	3-High	B	B	B	D
	4-V.High	C	C	C	D
2-Med. Low	1-Low	B	B	B	D
	2-Med	B	B	B	D
	3-High	C	C	C	D
	4-V.High	D	D	E	E
3-Med	1-Low	C	C	C	D
	2-Med	C	C	C	D
	3-High	D	D	E	E
	4-V.High	E	E	F	F
4-Med. High	1-Low	D	D	E	E
	2-Med	D	D	E	E
	3-High	D	D	E	E
	4-V.High	F	G	G	G
5-High	1-Low	E	F	F	F
	2-Med	E	F	F	F
	3-High	E	F	F	F
	4-V.High	G	G	G	G

APPENDIX IV

Resource Utilization Groups-III Classification (RUGs-III)

Residents' functional status and major physical conditions explain the resource use in nursing homes. RUGs classification system groups nursing home residents by resident characteristics so as to explain resource use. Data of two types were studied for this classification system: *measures of resource use and resident characteristics.*

Resource use was collected by self reporting by staff (nurses, therapists, etc.) of the total time they spent over a 24 hour period caring for each resident, including time directly involved in providing care or indirectly provided through interactions with other staff, physicians, family and others that benefited the resident. Wage-weighted staff times were developed as the resource measure. The weights acknowledge the differences in cost of care provided by
(e.g. registered nurse or a nurse's aide).

Resident classification was assessed using a version of the MDS - Minimum data set - resident demographics, medical condition, diagnosis, mental function, ADL's, behavior problems and services provided. Care was taken to use patient characteristics that could reliably be assessed or audited, which would reduce the possibility of nursing homes classifying residents into more expensive categories with little change in the actual cost of resources used.

RUGs III has seven hierarchy categories: special rehabilitation, extensive care, special care, clinically complex, impaired cognition, behavior problems and reduced physical function; describing types of residents in decreasing order of resource use.

Special Rehabilitation - four subcategories - based on amount of therapy resources (staff time) provided to the resident, with further splits based on ADL scores.

Extensive service and special care - based on the receipt of certain significant services (parenteral feeding, tracheotomy, suctioning, or ventilator care) or the presence of certain clinical conditions (e.g. quadriplegia, stage three or four pressure ulcers, coma,) respectively. Additional splits are based on the amount of treatment or ADL level.

Clinically complex based on the presence of conditions such as aphasia, hemiplegia, or terminal illness, or on the receipt of services such as dialysis or chemotherapy.

Cognitive impairment &/or Behavior problems - characteristics of cognitive impairment and residents without such characteristics but who daily have behavior problems including wandering, physical or verbal abuse, regressive behavior or hallucinations are assigned to the impaired cognition and behavior categories respectively. These two categories are restricted to residents with an ADL index score of 10 or less.

Reduced Physical Function - Residents who do not meet any of the above categories, including those who would meet the criteria for the impaired cognition or behavior problem categories but have a RUGs-III ADL index of more than 10.

The ADL index is a summary measurement of functional capacity, produced by combining four ADL measures (toileting, eating, bed-to-chair transfer and bed mobility)

TOILETING - How the resident uses the toilet (or commode, bedpan, urinal), transfers on/off toilet, cleanses, changes pad, manages ostomy or catheter, manages clothes (scale= 1,3,4,5)
BED MOBILITY - How resident moves to and from lying position, turns from side to side, and position body while in bed - (scale = 1,3,4,5)
TRANSFER - How resident moves between surfaces - to/from bed, chair, wheelchair, standing position (exclude to/from bath/toilet) - scale (1,3,4,5)
EATING - How resident eats or drinks (regardless of skill) - scale (1,2,3)

Descriptors of the Seven Hierarchical Categories (RUGs III)

1) **Special Rehabilitation** - (any combination of physical, occupational, or speech therapy)--4 subcategories

- very high intensity multidisciplinary rehabilitation-450 minutes or more of rehabilitation therapy, at least 5 days per week of one type of therapy, and at least two of the three therapies provided.
- high intensity rehabilitation -300 minutes or more of rehabilitation therapy per week, and at least 5 days per week of one type of therapy.
- medium intensity rehabilitation -150 minutes or more of rehabilitation therapy per week, and at least 5 days per week of rehabilitation therapy.
- low intensity rehabilitation - 45 minutes or more of rehabilitation therapy per week, at least 3 days per week of rehabilitation therapy, and at least two types of nursing rehabilitation occurring at least 5 days per week.

2) **Extensive Services**-Residents who have a RUG-III ADL index score of at least 7 and who meet at least one of the following criteria :

- Parenteral feeding
- Suctioning
- Tracheostomy
- Ventilator/respirator

3) **Special Care**-Residents who have a RUG-III ADL index score of at least 7 and who meet at least one of the following criteria:

- Burns
- Coma
- Fever, with vomiting, weight loss, pneumonia, or dehydration
- Multiple sclerosis
- Pressure ulcers or stage 3 or 4
- Quadriplegia
- Septicemia
- Intravenous medications
- Radiation treatment
- Tube feeding

4) **Clinically Complex**-Residents who meet at least one of the following criteria:

- Aphasia
- Aspirations
- Cerebral palsy
- Dehydration
- Hemiplegia
- Internal Bleeding
- Pneumonia

- Stasis ulcer
- Terminal illness
- Urinary tract infection
- Chemotherapy
- Dialysis
- Four or more physician visits per month
- Respiratory or oxygen therapy
- Transfusions
- Wound care other than pressure ulcer care, including active foot care dressings

OR;

- residents who meet the criteria for the extensive services or special care categories but who have a RUG-III ADL index score of 4 - 6.

5) Impaired Cognition-Residents with a RUG-III ADL index score of 4 to 10 who have cognitive impairment in all three of the following dimensions:

- Decision making (not independent)
- Orientation (any problem recalling current season, location of own room, staff names or faces, or that he/she is in a nursing home).
- Short-term memory

6) Behavior Problems-Only residents with a RUG-III ADL index score of 4 to 10 are classified in this category. Residents who display daily problems with:

- Inappropriate behavior
- Physical abuse
- Verbal abuse
- Wandering

OR with

- Hallucinations

7) Reduced Physical Functions -Residents who do not meet the conditions of any of the earlier categories, including those who would meet the criteria for the impaired cognition or behavior problems categories but have a RUG-III ADL index of more than 10.

RUGs-III ADL Index Ordinal Scale

ADL Variable	Score
Bed mobility, toilet use, and transfer:	
Independent or supervision	1
Limited assistance	3
Extensive assistance or total dependence:	
Other than 2-person physical assist	4
2 or more persons physical assist	5
Eating	
Independent or supervision	1
Limited assistance	2
Extensive assistance or total dependence	